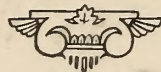




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Acc. No.	23551
Date	6-19-35

I PURPOSE AND SCOPE OF THESIS

II HISTORY OF EYEGLASSES

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BOSTON UNIVERSITY

COLLEGE OF BUSINESS ADMINISTRATION

THESIS

The Manufacturing and Marketing of
Eyeglass Frames and Lenses

by

IVY BERGER

(B. S. Simmons College 1930)

submitted in partial fulfilment of
the requirements for the degree of

MASTER OF COMMERCIAL SCIENCE

1935

6/19/35
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CHAPTER I

PURPOSE AND SCOPE OF THESIS

The purpose of this thesis is to present, in language intelligible to the layman, all the facts that it was possible to gather, in the time at my disposal, concerning the marketing and manufacture of eyeglass frames and lenses.

Because of the peculiar attitude of many of the manufacturers and distributors in the industry as a whole, this presentation of data will be limited in scope. Some firms, who undoubtedly have information available, prefer to keep such information for their own use. Only a few find themselves in a position to co-operate more generously with the research worker.

In view of these conditions, it is not surprising that there is practically no published material on the economics of the optical industry--and no material at all that is either comprehensive or recent. It is hoped that the beginnings made in this paper will stimulate further research in this field.

CHAPTER II

HISTORY OF SPECTACLES

The definition of spectacles in Webster's Collegiate Dictionary is: "a device to aid vision or protect the eyes, consisting usually of two lenses supported by a frame with a bridge over the nose and bows passing over the ears." We shall see that this is distinctly a modern conception of spectacles, since there was a time when the support consisted of two cords with weights which hung down on the wearer's chest or even no arrangement for keeping the glasses in front of the wearer's nose but his hand. Furthermore, the technical use of the word in library cataloguing and in periodical references includes all the range of devices to aid vision--from heavy protection goggles to the pince-nez which does not have bows at all, and may even be rimless and frameless, simply having a mounting.

EARLIEST GLASSES: Before the thirteenth century, the origin or use of spectacles is a matter of conjecture. "A Chinese emperor is said to have used lenses to observe the stars in 2283 B. C."¹ Some

¹ The discussion of the earliest evidence of glasses is based on three sources: "History of Eyeglasses and Spectacles" by Dr. Emory Hill, from which this quotation is taken; "The History of Spectacles" by Carl Barck; "The Origin and Development of Spectacles" by C. J. S. Thompson.

old pictures exist which show Chinese reading with glasses that have large oval lenses. These glasses are also mentioned in the writings of Marco Polo who visited China in 1270. He found the people using lenses ground from quartz¹ or semi-precious stones. Carl Barck¹ has found in the early records of travelers the mention of the use of lenses in China made of a slightly-yellowish brown stone called "schachi" or teastone--most probably a kind of topaz. The tortoise was an animal sacred to the Chinese, and wearing glasses with tortoise shell was supposed to bring good luck. Many of the semi-precious stones which were used for the lenses were also supposed to be symbolic of good luck because they came from sacred mountains.

Spectacles, in early times, were not always worn to aid vision. Frames did not imply lenses, but might be worn merely for purposes of appearance and prestige, and as an indication of superior social status and learning. A custom of etiquette, that an inferior should remove his glasses in the presence of a superior, survived in Germany until a recent date, but originated in China from this conception.

Frequently, we find this idea that glasses impart a dignity to the wearer carried still further. There are pictures, such as this fifteenth century one of St. Jerome,² patron saint of the Optician's Guild, that have

¹

Barck, Carl, "The History of Spectacles."

²

Figure 1.

glasses at a time when there were no glasses in use. In this picture, the glasses are just under the slant of the table on which St. Jerome is leaning. They are of the heavy bone or wood-frame type, and are either a decoration and part of the carving, or may be hung up there for convenience' sake when not in use. In other pictures, one can find the subjects actually wearing glasses, in spite of the fact that medical and non-medical literature of the period when these subjects lived does not indicate the knowledge of any glasses. It is simply a compliment on the part of the painter, or a symbolic way of showing knowledge, learning and superior social status.

Chinese Glasses: In the background of the picture (from "Fashion's Glass") is a Chinese man wearing heavy glasses of the type that were probably worn when glasses were first used. They are the kind that Marco Polo spoke of when he came back from his trip to the Orient. Some of them were, later on, (notice the pair in the inset ¹) like the glasses that were presented to Marco Polo by a mandarin. "The lenses were set in a beautiful frame of ivory carved in intricate design by cunning craftsmen."² In the other picture (from "The Eye and How We See"³--Better Vision Institute) are depicted in more detail the glasses that were worn by

¹ Figure 2.

² Better Vision Institute, "Fashion's Glass."

³ Figure 3.

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Figure 2.

Figure 3.

Figure 4.

A PHOTOSTATIC COPY
from
"The History of Spectacles"
by
CARL BARCK



ST. JEROME.

After a mural painting by Ghirlandajo (1449-1494) in the church
of All Saints (Ognissanti) at Florence.

ILLUSTRATION I
Figure 1

the Chinese. Some of them had cords tying in back of the ears, and some of them had the cords hanging down to the waist of the wearer. In this latter style, one frequently hung his personal trinkets and treasures from the ends of the cords.

Glasses
in the
Occident: We do not find any indisputable evidence that glasses were first invented by the Caucasians or even known to the early civilizations, but we do find many interesting references to disputed points that some people have tried to submit as evidence:

"Amongst the ruins of old Nineveh an interesting find was made by Sir Henry Layard (Discoveries Among the Ruins of Nineveh and Babylon, 1853, p. 197) namely a lens of rock crystal." ¹ This oldest lens in existence is plano-convex, 1 1/2 inches in diameter with a focus of 4 1/2 inches. It is fairly well polished, but we do not know for what it was used or whether this one specimen is indicative of a general employment of eyeglasses. Even if the old Assyrians and Babylonians did possess this art of making eyeglasses, it was lost afterwards. To the ancient Hebrews and Egyptians spectacles were unknown.¹

"The Greeks were likewise unacquainted with them. In the four treatises on 'optics' by Euclid, Heron, Ptolemaeus and Damianus which have come down to us,

1

Barck, Carl, "The History of Spectacles."



Chinese Spectacles

Figure 2



Inset
Figure 2

ILLUSTRATION FROM
"THE EYE AND HOW WE SEE"
BETTER VISION INSTITUTE



THE CHINESE—*First to Wear Spectacles*

Figure 3

not the least mention is made of them. They knew only that by means of the so-called 'shoemaker's globe', a glass sphere filled with water, the rays of the sun could be collected and combustible bodies ignited. Aristophanes, in his comedy, 'THE CLOUDS' alludes to this as a well-known fact."¹

"Among the Romans, the shoemaker's globe became a regular part of the instrumentarium of physicians, who used it for cauterizing: later on they also observed that small objects became magnified by it." "Winkelmann in his HISTORY OF ART (1776) drew the conclusion from the most minute carving of some of their gems that this could not have been executed had the engravers not possessed magnifying glasses. But his further deduction as to the similarity of these to ours is unwarranted."¹

Did Nero
Wear Glasses?

There is a single passage in Pliny relating to Nero that has been interpreted by Carl Barck. This is what Barck has to say about the much-disputed passage (based on Lessing, in the 45th of his "Antiquarian Letters," 1768):

"The original reads as follows: 'Nero princeps gladiatorum pugnas spectabat in smaragdo, The emperor Nero viewed the combats of the gladiators in an emerald.' Some scholars construed this to mean that Nero used an emerald as we do glasses, and concluded even that Nero

¹ Barck, Carl, "The History of Spectacles."

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"Antiquarian Letters", 1753):

"The original reads as follows: 'Nero princeps
gladiatore pugnas spectant in emarginato, the emperor
Nero viewed the combats of the gladiators in an emargin-
ated bowl. Some scholars considered this to mean that Nero used an
emarginated as we do glasses, and concluded even that Nero

Barré, Carl, "The History of Spectacles."

was near-sighted. But this latter opinion, although it has become fixed in the popular mind, is certainly not true, because Pliny, at another place, makes the direct statement that the eyes of Nero were weak for near objects unless he blinked: 'Oculi Neronis, nisi cum conniveret, ad prope admota hebetes.' And Suetonius calls them 'caesii et hebetes--dull and weak.' Nero was either far-sighted or astigmatic, but not near-sighted.

"The sentence just prior to the first-quoted passage, that Nero viewed the combats in an emerald, deals with emeralds in general, and states that they, when large enough, are inclined to reflect the images of objects as mirrors do. The logical relation of these two sentences, and the direct statement in smaragdo 'in an emerald' leaves hardly any doubt that Nero used the emerald like a small mirror. Had Pliny wanted to say that the emerald was used like our spectacles, per smaragdum, 'Through an emerald,' would have been the phrase."¹

"There being no other reference to glasses in the entire Latin literature, medical as well as non-medical, we may safely state that the use of spectacles was just as unknown to the Romans as to the other ancient nations. Nor is there any mention of them during the first twelve centuries of the Christian era."¹

¹ Barck, Carl, "The History of Spectacles."

was near-sighted. But this latter opinion, although it has become fixed in the popular mind, is certainly not true, because living, at another place, makes the direct statement that the eyes of Nero were weak for near objects unless he looked. 'Gould Kerensky, what can you say?' and proper advice follows. 'And Kerensky calls them 'near-sighted' and weak! Nero was either far-sighted or near-sighted, but not near-sighted.

"The sentence just prior to the first-quoted passage, that Nero viewed the combat in an enclitic, deals with enclitics in general, and states that they, when large enough, are inclined to reflect the images of objects as mirrors do. The logical relation of these two sentences, and the direct statement in enclitic 'in an enclitic' leaves hardly any doubt that Nero used the enclitic like a small mirror. Had Pliny wanted to say that the enclitic was used like our spectacles, he would have said, 'Through an enclitic, 'would have been the phrase."

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Thirteenth Century Glasses: The end of the thirteenth century, however, brings with it testimonials from many different sources pertaining to the use of glasses.

We have already spoken of Marco Polo. The famous philosopher, Roger Bacon, speaks of glasses which cause small letters to appear large; this was in 1276. Some authors, therefore, attributed the invention of glasses to him.¹

"It is certain that Bacon knew something of optics (his monumental work the "Opus Major, 1268" treats of the science of optics and antedates Italian claims) but it is not certain that his knowledge was original."²

With communication as poor as it was in the thirteenth century in Europe, it was more than likely that the invention of glasses should be attributed to every city in which they appeared.³

The credit for the discovery belongs most probably to one of two Italians, who were friends or closely acquainted. Salvino d'Armato degli Armati and Alessandro della Spina. Armati was of noble family and died in 1317. On his tombstone in Florence there is the inscription, "here lies Salvino d'Armato degli Armati, of Florence, the inventor of spectacles. May God forgive his sins. He died anno Domini 1317." As the year of discovery, 1285 is assigned.¹ Another angle to consider is that Bacon's knowledge may

¹ Barck, Carl, "The History of Spectacles."

² Hill, Emory, "History of Eyeglasses and Spectacles."

³ See illustration from "The Eye and How We See," Figure 4.

have been transferred to Italy by a member of his order who made a prolonged stay in Florence.

Spina was a Dominican monk of Pisa. In the monastery archives the year of his death is given as 1313, and the following is related of him: "Brother Alessandro della Spina, a modest and good man, learned to make all industrial products of which he saw or heard. Spectacles which were made first by some one else, who did not want to communicate anything about them were then made by him and were distributed with a cheerful and benevolent heart."

The dictionary of the Academy of Florence (1729) contains under occhiali ("spectacles") the following: "Rivalto, a monk of Pisa, in a sermon delivered on February 23, 1305, made the following statement: 'It is not 20 years since the art of making spectacles one of the most useful arts on earth was discovered. I, myself, have seen and conversed with the man who made them first.' Whether he meant Armati or Spina can not be decided.

Whatever may be the theories of the origin of glasses, none of them proven, we have historical data for the statement that they were known in China and in Europe in the thirteenth century. "It is to be noted that early Chinese glasses were of essentially different design from early European glasses, being large lenses, oval rather than round, with rims of tortoise shell and bows of brass or copper, resting against the temples. European glasses of the thirteenth century, on the contrary, were nose

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made first by some one else, who did not want to communicate

anything about them were then made by him and were distrib-

uted with a cheerful and benevolent heart."

The Dictionary of the Academy of Florence (1799) con-

tains under occhiali ("spectacles") the following: "Giovanni

a monk of Pisa, in a sermon delivered on February 22, 1305,

made the following statement: 'It is not 30 years since

the art of making spectacles one of the most useful arts

on earth was discovered. I, myself, have seen and con-

versed with the man who made them first.' Whether he

meant Arnald or Spina can not be decided.

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European glasses, being large lenses, oval rather than

round, with rim of tortoise shell and jaws of brass or

copper, resting against the temples. European glasses

of the thirteenth century, on the contrary, were none

glasses with circular lenses. The Chinese variety conforms to the type found in Asia and suggests a separate origin from European. Beginning with the early eighteenth century, European glasses were imported into China and have since been the prevailing type."¹

Clerical and Medical Attitude: Conservative clergy and medical men condemned the new remedial measure. Clergy felt that those who manufactured and dispensed glasses were opposing God and were in league with the Devil. Physicians felt that the new remedy was not particularly effective and should be resorted to only as a last extremity. "Bernard Gordon, professor in Montpellier, first physician to mention glasses declared that they were unnecessary if his famous eye remedies were used. Guy de Chauliac, physician to many popes, recommended glasses if his eye lotion did not first effect a cure."¹

Construction and Use of Earliest Eye-Glasses: "The earliest known lenses seem to have been intended exclusively for the relief of presbyopia, that is failing eyesight due to advancing age. The strongest lens is 3.00 spheres (normal vision is 0.00). They were plano-convex or weakly concave on one side. It is probable that they were first used as the modern hand glass and held close to the object viewed. Only gradually were methods devised to hold the glasses before the eyes; these primitive

¹ Hill, Emory, "History of Eyeglasses and Spectacles."

devices were essentially eyeglasses not spectacles. They consisted of one or two lenses surrounded by heavy rims. The rims of various materials, metals and leather, were joined by a solid bar. These might rest against the wearer's nose, but were insecure and had to be held by the wearer's hand. For convenience, handles were attached so that the hand rested at the chin or on the forehead. One model shows a branched handle attached to both rims and joined below the chin. Another was attached to the wearer's cap; this is still seen in Persia. Cords were tied about the ears¹ or suspended over the ears."

"The oldest pair of glasses in preservation is in the Nuremberg museum, to which they were donated by the antiquarian, Jacques Rosenthal, of Munich, who found them in an old volume of the latter period of the fifteenth century. (Greeg, Zeitsch fur Opthal. Optik. July, 1913.) These are the primitive type of round rimmed eyeglasses with a solid bow joining the rims. They are made of leather, partly of natural color and partly black. The lenses are lacking. The frames are larger and thicker and therefore thought to be older than the interesting glasses of Wilbrand Perkheimer (1470-1530) also in the Nuremberg museum. (Greef Arch. fur Augen. 72. Jegt 1, 1912) When Perkheimer's home was torn down in 1867 and removed to Wartburg where it remains as a memorial to

1

Hill, Emory, "History of Eyeglasses and Spectacles."

the worthy burgomaster who was a friend of Martin Luther and Albrecht Durer, an ancient pair of glasses was found in a cranny of the wall where they no doubt fell from the wainscoting on which the old man had placed them when he laid aside his reading. They are of leather, polished black on the front surface. These glasses, like the older pair, are the common type in the pictures and tapestries of the middle ages."¹

GRADUAL MECHANICAL IMPROVEMENTS: From these early glasses to the present-day glasses has been a long step--or rather many long steps.² The sequence of the evolution of glasses is seen to be: crude eyeglasses, transition forms, crude spectacles, perfected spectacles, perfected eyeglasses. In place of the solid bow, or bridge as it is called today, a jointed band of metal was substituted and was a great improvement. It allowed the lenses to be separated or drawn closer together according to the width of the nose with additional security. Iron, silver, gold, wood, bone, ivory, horn, and leather were used for frames. These were of natural color or polished and sometimes highly ornamented by carving and filigree work. Illustrations from "The Connoisseur"² show that in the eighteenth century and even the early nineteenth century some of the early models, slightly improved, were used. Few of the early lenses, however, have been preserved;

¹ Hill, Emory, "The History of Eyeglasses and Spectacles."

² See Figures 5, 6, 7.

the old frames seen in the museums usually have been devoid of lenses. They were made of rock crystal, topaz, emerald, in fact any fairly transparent stone. A variety of such stones was formerly called beryl.¹

Today we have glasses that are almost invisible on the face of the wearer, and are adjusted becomingly to the facial contour of the wearer. There are recent improvements that even permit the assembling of the entire frame without any screws. "Loxit," a patented type of clamp, is substituted for screws. We shall go further into the modern glasses when we take up the changing fashions of spectacles through the years.

PROTECTION FROM LIGHT, COLORED GLASSES: For centuries, one of the functions of glasses has been protecting the eye from excessive light. "Primitive tribes in various parts of the world devised protective goggles before contact with civilization brought knowledge of glasses. The Esquimos have long used wooden goggles hollowed out to fit over the eyes and attached behind the head by strings of leather or sinew. Small round holes served to admit the light while the back of the wood was darkened with smoke, graphite, or black paint. Among the Chinese, a sort of visor, like the peak of a jockey's cap was used as well as goggles.

"Another protective device is the celluloid spectacles

¹ The above discussion is based on Hill, Emory, "History of Eyeglasses and Spectacles."

manufactured in Stuttgart, Germany. These are white or grey and close fitting with holes to admit air. They were intended for protection from foreign bodies and from bright light, for which purpose mountain climbers use them.

"Primitive means of escaping the discomfort and harm of glaring light reflected from snow, sand, and water have gradually given way to spectacles containing tinted lenses. Colored glass was made by the ancients but only in the latter half of the sixteenth century were transparent colored lenses used for protection against glare. In the 17th century, Venice was the source of most of the colored glass. E. E. Schreiner of New York, has investigated this subject ("Short History of Colored Glasses and Lenses from 1561 to 1913"). He finds that the earliest reference is to green lenses manufactured in 1561 by Aucott of Middlesex County, England. In 1672, Pierson of London sold blue glasses. In 1767, George Adams of London advertised smoke glasses under the name of "gray." The first American record is an old advertisement of one James Peters, of Philadelphia, announcing white, green, blue, and gray lenses for sale. Amber lenses were made by George and Elias Solomon, opticians of Bedford Square, England, in the year 1832. Chevalier of Paris, in 1873, used two plates of glass, one in dark blue and the other dark smoke, which he called "electric." In 1880, the Chlorophyll green lens was made by Fargier of Paris who claimed for it the property of absorbing ultraviolet rays. In 1885, William

Thompson of Philadelphia proposed the amethyst glass obtained from windows tinted by long exposure.¹

THOMAS YOUNG In 1801, Thomas Young, an English scientist, **DISCOVERS**

ASTIGMATISM: in experimenting with his own eyes, discovered the condition of astigmatism. He also made the recommendation of cylindrical lenses for the correction of that difficulty. (Astigmatism and its correction is discussed in more detail from the medical point of view in Chapter 3 of this paper.) The optical firm of McAllister of Philadelphia ground spherocylinder lenses for the correction of astigmatism in 1829; and it is believed that spherocylinder lenses were first ground in America. "When the factor of eyestrain based upon astigmatism received appreciation, the making of glasses rapidly became an important industry ministering to the needs of thousands who were unconcerned with the opticians so long as it applied only to the aged and the grossly farsighted or nearsighted individual."¹

BETTER In the nineteenth century there were, also,
REFRACTION:

many improvements in diagnosis of ocular difficulties and in accurate refraction. Although it is not within the scope of this paper to go into detail concerning the improvements in ophthalmic equipment, certainly the name of Helmholtz (1851) and his ophthalmoscope, and the work of Donders ("The Refraction and Accommodation of the Eye,") 1864 should be mentioned. These were a great help to

1

Hill, Emory, "History of Eyeglasses and Spectacles."

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HALL, Henry, "History of Eyes and Spectacles."

mankind and, furthermore, were the means of securing tolerant and sympathetic co-operation of the medical profession in the refraction of the eye, which gradually replaced the early antagonistic attitude.

PRISMATIC LENSES: "The origin and early uses of prismatic lenses

are unknown. In 1844, Charles Chevalier of Paris recommended glasses for the correction of squint.

It is possible that he meant prisms, for at that time there was no appreciation of the relationship between errors of refraction and the squint."¹

FRANKLIN'S BIFOCALS: That grand American, Benjamin Franklin,² has

his name in more than one niche in the hall of fame. In the year 1784, he is credited with the invention of bifocal lenses. His own statement from "Posthumous Works of Benjamin Franklin," page 173, is as follows: "I had two pairs of spectacles that I used alternately because traveling, I sometimes spent the time in reading, sometimes in looking at the country. The change from one pair to another was troublesome and often was not effected soon enough to allow me to see what I wanted. I had my glasses cut in two halves, one half of each being put in the same frame. In this way I wear my spectacles constantly, and I have only to look through the upper and through the lower part in order to see distinctly for distant objects or near

¹ Hill, Emory, "History of Eyeglasses and Spectacles."

² Figure 8.

objects."¹

Bifocals have undergone many changes in recent years and the improvements have been numerous. Some of the improvements have supposedly been improvements in the bifocal to allow for better focusing or clearer vision; and some of them have been for the sake of appearance and the making of the division of the bifocal less conspicuous. Cemented segments and fused segments are improvements over simply two halves as there were in Franklin's day. There will be more about the modern bifocal in another chapter of this paper.

RIMLESS SPECTACLES:

Waldstein, of Vienna, in 1840 devised rimless spectacles, attaching bridge and bows to the lenses by means of clamps and screws in place of the former method of inserting the bevel edge of the lens in a grooved eye wire. This kind of spectacle has become more and more popular. By 1850, rimless spectacles with light hook temples appeared in England with "riding bows" varying in flexibility from stiff ten-carat gold bows to soft "cable" or "half-cable" and "spirals." This brings us up very close to the modern spectacles--which consist of about seventy-five per cent rimless and some twenty-five per cent framed glasses for greater strength and wearability.²

1

From original quotation found in Hill, Emory, "History of Eyeglasses and Spectacles."

2

This estimate of percentage of rimless and framed glasses sold today is by Mr. Arthur Collins of the Bausch & Lomb Optical Company. (Boston Office.)

LIBRARY SPECTACLES: For about fifteen years, starting about the time of the second decade of the twentieth century, heavy zylonite-rimmed spectacles were very popular. They were worn for sports and library and dress alike. They were extremely comfortable and are still seen today. The Guildcraft--magazine of the Opticians Guild of America Incorporated--says that library spectacles were like old house slippers. They were comfortable for wear in privacy, but not for appearance in public. On the other side of the question is an optician's statement, made to me in confidence, to the effect that opticians preferred to sell the fragile, rimless frames because they were much less sturdy than the heavy-rimmed ones and were, consequently, a greater source of repair-business income.

Detailed progress of the improvements in the mechanical construction of the eyeglass can be traced up to the year 1910 or so in the "History of Eyeglasses and Spectacles" by Dr. Emory Hill.

THE FASHION ELEMENT IN SPECTACLES: In the early history of the spectacle, we have indicated that the mechanical improvements assumed the center of importance. Today, we have glasses that are secure before the eyes, comfortably adjusted, and correctly fitted for the correction and relief of eye defects. They are, furthermore, beautiful in themselves and in their effective harmony with the dress and facial contour of the wearer.¹

¹

Figures 9 and 10.

In "Fashion's Glass," published by the Better Vision Institute in 1934, the trend of fashion in glasses and the comparative fashions in jewelry and in clothes is presented in an altogether charming and delightful way. The following discussion of the recent fashion elements in eye wear is based partly on the last two pages of "Fashion's Glass" (from which the illustrations are taken) and partly from observation of eyeglasses displayed in the better shops¹ and worn by fashionable Americans.

On the beach there are the metal or shell-framed colored lenses that are used to protect the wearer from excessive glare of sun and sand. These are generally of a cheap glass that has no corrective powers; and the frames are also of poor construction. No particular attempt is made to adjust them to the wearer, who is in the habit of purchasing them carelessly at some notion store, drug store, or even wayside stand. It is to be hoped that the agitation on the part of opticians and optometrists to educate the public to the dangers of exposing the eyes to strain, even when wearing colored glasses, will result in more lenses being made that will be both protective from the point of view of the eyestrain relief and the correction of visual defects, as well as the amelioration of strain due to the glare of lights.

Some progress has been made in the introduction of glasses that have a slight degree of coloring, as the

1

Figure 11.

For Every Occasion

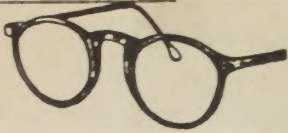


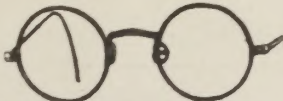


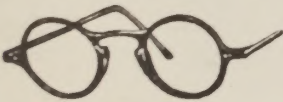
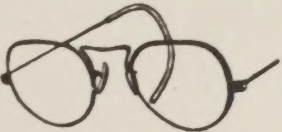

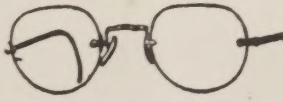
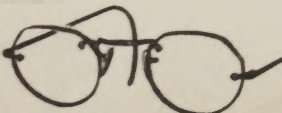
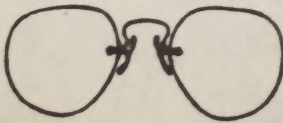
 <p>Shell frames with specially-shaped tinted lenses. High, comfortable bridge and ear pieces.</p>	 <p>Metal-rimmed with folding bridge. Lenses shaped to provide maximum protection.</p>
 <p>Heavy gold frame, tinted lenses and high-set earpieces produce a highly desirable unit.</p>	 <p>Sturdy gold frame, tinted lenses. Shell or shell and gold combined equally appropriate.</p>
 <p>The folding oxford—with engraved, white gold rims and chain—is distinguished.</p>	 <p>The rimless eyeglass with white gold mounting is light, restrained, and inconspicuous.</p>
 <p>Shell mountings are strong and light. Special nose bridge holds glasses firmly in place.</p>	 <p>Streamlined gold frames, special "orbit" shaped lenses designed for maximum vision.</p>
 <p>Smart, custom-designed lenses, gold mounted and with cushion nose-rests.</p>	 <p>Distinctive, conservative glasses appropriate for the busy executive.</p>
 <p>Rimless spectacles. Engraved bridge and earpieces may be high or low as desired.</p>	 <p>Up-to-the-minute pince-nez eyeglasses with white gold mounting and well-shaped lenses.</p>

Figure 11

"cruxite" and "soft-lite" lenses that come in two or three degrees of color and are suitable for reading in strong light, but a great deal more can be done in promoting the sale of ophthalmic lenses in protective glasses and goggles of all kinds.

For everyday wear, where rough use of glasses is likely, it is suggested that some kind of rimmed glasses be worn. There are shell-rimmed glasses that are an adaptation of the earlier library spectacles. They have metal reinforcements of the shell, and frequently have a metal bridge instead of the shell bridge. They are more durable and less brittle than the all-shell glasses and are designed in a less heavy manner than the library spectacles. They are to be recommended for sports, for workmen and manual laborers, for students who are careless with their glasses, and for the housewife.

An alternative to the shell or combination shell and gold-rimmed glasses is the metal-rimmed glasses. These are usually gold or gold-filled and come in the plain round frames as well as in some of the more fancy-shaped frames. In the gold, the frames are much more expensive than the shell, but there are also available a number of metal frames, such as the chromium and rhodium-plated frames that are very satisfactory and even less expensive than the shell frames.

Although there have been sterling silver frames in the past, there seems to be no manufacturer who is

specializing in them at present, although I have heard of one small Boston manufacturer who is thinking of installing the equipment for the manufacture of silver frames.

The most popular, and I think the most universally becoming spectacles and glasses today, are the so-called rimless. These may or may not have temples (pieces that go over the ear and hold the glasses on with little or no pressure on the nose of the wearer); and may be plain, round, or oval in the shape of the lenses, or may be cut in angular or curved or a combination of angular and curved designs. The styles that have no temples have a special clamp arrangement that holds on to the sides of the nose. Although they are popular because they are less conspicuous than those that have the temples, they are not very comfortable. I know of a woman whose nose was irritated to such an extent from the wearing of pince-nez glasses (as these glasses without the temples are called) that her physician warned her against their further use. He predicted (a physician at the Huntington Memorial Hospital) that in his opinion there was even the danger of the formation of a cancer from the continued use of these glasses.

The classification of glasses that is given in the pictures on the next page is from "Fashion's Glass," published by the Better Vision Institute. It seems to me that several of the classifications could, for practical purposes, be grouped. Most people would have sufficient

style changes in glasses if they had one pair for strong lights--such as the beach; one pair for sports or rough work; and one pair of dressy rimless glasses for business, or social obligations.

Perhaps the latest color of gold is the so-called pink gold. It is supposed to be most nearly the color of the skin and is a cross between the yellow gold and a copper color. Formerly, the white gold held the center of the fashion stage, and it is still very popular with people who have gray or white hair.

FITTING GLASSES TO FACIAL CONTOUR: There are those men and women who

would rather suffer eyestrain than wear corrective glasses. They have a strange feeling that glasses will not be becoming to them and therefore they put off, as long as possible, the day of wearing them.

Today the objections of such self-conscious people can be met in part by the sales talk of the optician who is alert to the style elements in the selling of glasses. In part the objections can be overcome by the oculist or the optometrist who points to the medical difficulties that may be involved in putting off too long the proper fitting of glasses. The up-and-coming eyeglass dispenser will also make his point of fitting glasses to the correct facial contour count.

In the previous section on the Fashion Element in Eyeglasses, there was a choice given in the selection

of the correct eyewear for various occasions. In making a selection among the correct styles, the salient principle to keep in mind is good design for the face in question. The ideal shape of the face is oval or egg-shape. Any deviation from this shape should be counteracted by good principles of dress that will be extended to the eyewear.

For example, let us take the case of the woman who has a broad, square, or round face. She must avoid all accents that will increase that roundness. She should wear V necklines. She should affect a style of hairdress where the hair is combed away from the forehead and gives more apparent length to the face. She should not have her hair drawn severely back from her face. She should avoid circular lines in her hat and adopt those which will add height.¹ In the illustrations I, II, and IV, we have subjects with this shape of face.² Drawing conclusions from the shapes of glasses and the comments under them, we find that round-faced individuals will do well to avoid heavy rims, oblong-shaped lenses, or any shape that tends to accentuate roundness or width. They should adopt any shape that has lenses that are longer than they are wide or apparently so. Since they break up impressions of roundness, angular shapes, or those that are a combination of angles and curves, are best.

The person with the long face can adopt just the

¹ See Figures 9 and 10.

² Figure 9.

styles that are so difficult for the person with the round face. The glasses that are wider than they are long and the large round-rimmed ones are excellent. Illustration III is a good example of the correct glasses for the long-faced individual. A woman with a long face should help the effect of properly fitted glasses by wearing round necklines or boat-shaped necklines. She should fluff her hair out at the sides if her personality can stand that bit of flippancy, and perhaps wear some hair on her forehead in bangs or deep waves. She should avoid hats that added too much height.

The person with the oval face has much to be thankful for. He or she can choose from almost any style and be sure that it is becoming. That person should, however, give some consideration to the features. Illustrations V and VI show how much can be done for the nose by the proper choice of bridges in the eyeglasses. A high bridge, naturally, will lengthen a short nose, while a bridge placed low will overcome the apparent length of the nose or hide a hump or unbecoming curve. A moment's study of the illustrations will repay the person who is interested in his personal appearance; and knowledge of style and design principles should mean additional dollars in the pockets of eyeglass dispensers as well as customers who are more satisfied that personal and valuable service has been rendered by the dispenser of eyeglasses.

CHAPTER III

HOW CORRECTIVE LENSES HELP

PARTS OF THE EYE: According to the introductory statement in

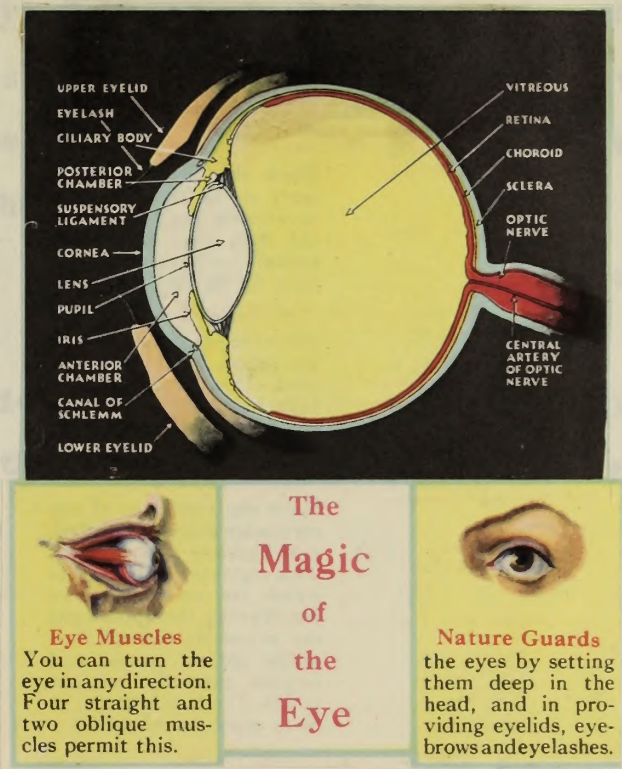
Better Vision Institute's "The Eye and How We See," we gain about eighty-five per cent of our knowledge and control about eighty per cent of our muscular movements through the use of the eye. The more common parts of the eye are indicated below: The retina is the photographic film of the eye and is colored red in the accompanying diagram.¹ The image we see is focused on the retina and carried to the brain by the optic nerve. The focusing apparatus is the lens which is convex on both sides. The lens has the power of expanding and contracting (this power is called accommodation)--the lens rounds out more when you look at a near object than at an object far away.

The iris is the colored part of the eye which opens and closes the pupil to let in an adequate amount of light. In bright light, the pupil becomes small; in darkness, it becomes large. The cornea, which is at the front of the eyeball, is transparent and shaped much like a watch crystal. The eyelids and eyelashes

1

Figure 12.

PARTS OF THE HUMAN EYE



This illustration is used with

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BETTER VISION INSTITUTE

Figure 12

and the membrane lining the eyelids (called conjunctiva) are protective. The large lemon-colored area in the drawing represents a jelly-like substance called the vitreous humor of the eye. In the anterior chamber of the eye is a secretion of aqueous humor, and the eyeball in order to retain its shape needs a nice balance between the vitreous humor and the aqueous humor.¹

NORMAL VISION OF THE EYE: The normal vision of the eye is a function

much like that of the camera. The image, when the eyelids are open, sends out rays of light which pass through the cornea and lens of the eye and cause an image to be reflected on the retina. This image on the retina is up-side-down and varies in size inversely to the distance of the eye from the original object viewed. The image is carried to the brain by the optic nerve and there the "developing" adjustment is made and the image is translated into its proportionate size and is right-side-up.

Just as a camera has to be focused for near and far objects, so the eye changes the focus of the lens by the marvelous action of the ciliary or control muscle. In old age, sometimes this power of change, or accommodation, becomes lessened and causes eye trouble. Frequently, even in youth, there are defects of the eye which can be ameliorated by the use of eyeglasses or

1

The above discussion of the parts of the eye is adapted from "The Eye and How We See"--Better Vision Institute.

spectacles.

COMMON EYE DEFECTS AND CORRECTION: The following paragraphs are adapted from three major sources: "The Eye and How We See," Better Vision Institute; "Eyesight Conservation Survey," Joshua E. Hannum; and "The Prescribing of Spectacles," Archibald Stanley Percival.

The eyes are granted us by the Almighty in varying states of perfection. This original condition may be improved by the use of glasses where necessary and the avoidance of abuses of the eye such as reading in a poor light, too long periods of close application without frequent intervals of rest, reading on moving vehicles, permitting improper or inadequate lighting. The early detection and correction of eye defects by wearing glasses will prevent eyestrain, and many of the consequent discomforts such as headache, vertigo, and digestive disturbances. Defects of vision which may be corrected by glasses are:

1. hyperopia or farsightedness
2. myopia or nearsightedness
3. astigmatism
4. presbyopia or change due to increasing age
5. double vision or cross-eye or strabismus

HYPEROPIA: "At birth our eyes are not fully developed and there exists a natural farsighted condition which disappears as the eye develops and becomes full size. Farsightedness is a condition where the

spectacles.

COMMON EYE. The following paragraphs are adapted from
DISTRICT AND
CONSTRUCTION: These major sources: "The Eye and How We

See, "Better Vision Found;" "Nightlight

Conservation Survey," "Johns E. Newman," and "The Eye-

spectacles," "Archibald Stanley Perceval.

The eyes are granted us by the Almighty in varying

states of perfection. This original condition may be

improved by the use of glasses where necessary and the

avoidance of abuses of the eye such as reading in a

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2. Myopia or nearsightedness

3. Astigmatism

4. Presbyopia or change due to increasing age

5. Double vision or cross-eye or strabismus

HYPEROPIA: "At birth our eyes are not fully developed

and there exists a natural farsighted con-

dition which disappears as the eye develops and becomes

Full size. Farsightedness is a condition where the

eyeball is too short; that is, the retina is too near the lens of the eye and the rays of light tend to focus back of the retina. The eye, however, has a natural tendency to overcome farsightedness by the involuntary action of the ciliary muscle which increases the convexity of the lens. As age increases and the muscle hardens the strain and expenditure of nervous energy causes headaches and blurring of sight."¹

In the accompanying diagram,² the blue lines indicate (in an exaggerated form) rays of light that tend to focus behind the retina of the eye because of the condition of farsightedness and the eyeball that is too short. When the convex lens is introduced (as in a pair of spectacles) we have rays of light, represented by the red lines, passing through the artificial lens which causes a more normal focusing of the image on the retina. Uncorrected farsightedness, or hyperopia, is shown on the smaller chart in a graphic way. Some of the other defects of the eye, in uncorrected form, are also shown with illustrative drawings of subjects suffering from these defects.³

MYOPIA: Myopia, or nearsightedness, is just the opposite from farsightedness. It is caused by too long an eyeball or too strong a refractive power of the lens of the eye, and the consequent focusing of the rays of

¹ Hannum, Joshua E., "Eyesight Conservation Survey."

² Figure 13.

³ Figure 17.

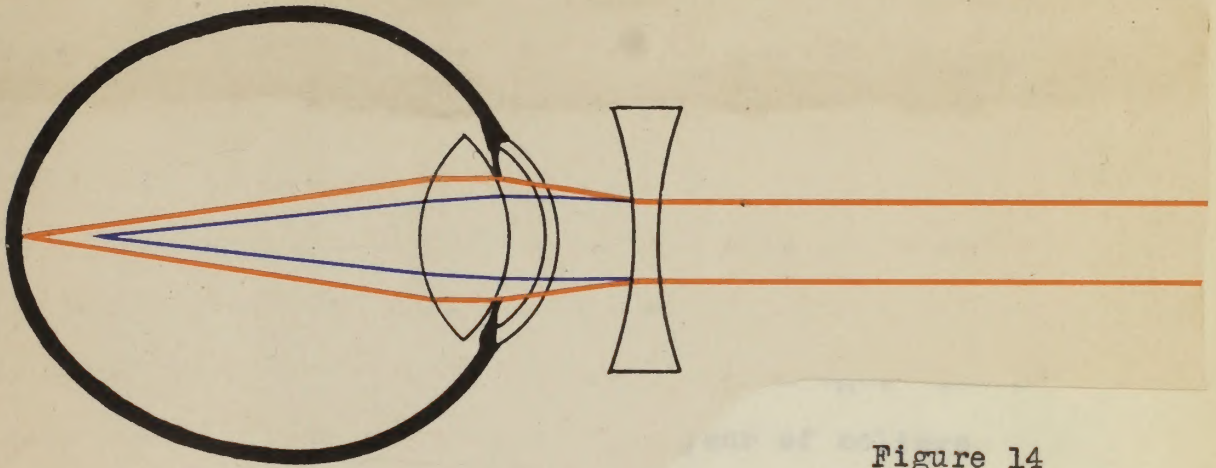


Figure 14

NEARSIGHTEDNESS--Corrected by a Concave Lens

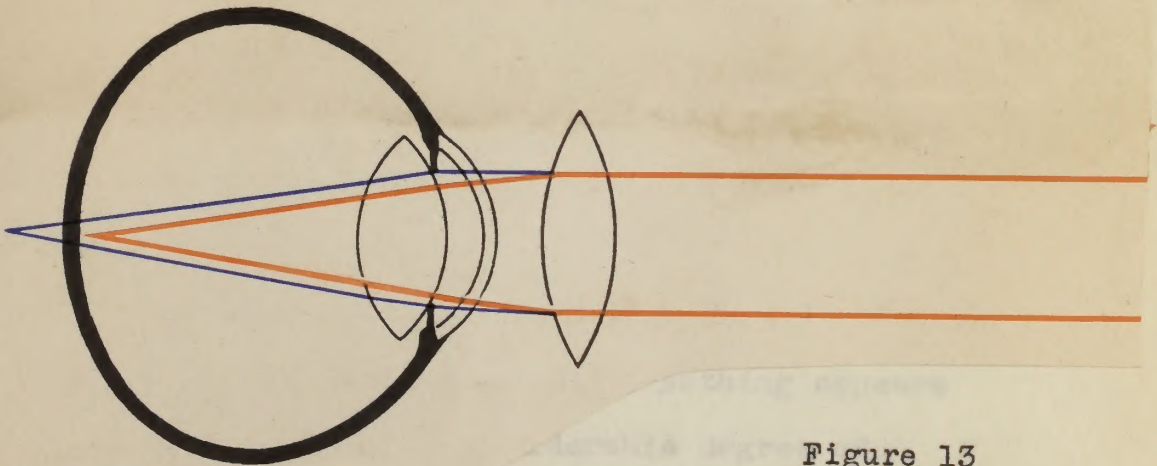


Figure 13

FARSIGHTEDNESS--Corrected by a Convex Lens

light in front of the retina instead of on the retina. This condition may be corrected by the use of a concave eyeglass lens which spreads the rays of light and moves the focus further back until it focuses on the retina.

¹
The chart --with the rays of light, represented by blue lines, in an uncorrected condition of myopia focusing in front of the retina, and the red lines representing the rays focusing correctly after passing through a concave lens--makes the condition more clear.

Progressive myopia refers to the fact that near-sightedness has a tendency to increase with age. There is an increase of from 2.5% for each year of college age; and an increase of from 4.27% nearsighted students at the age of 8 1/2, to 19.33% nearsighted students at the age of 17 1/2. (Risley, Samuel D., "Good Vision as a Factor in School Progress"; 4th International Congress on School Hygiene; Transactions, 1913, Volume 5, pages 56-62.)²

ASTIGMATISM: This third common error of vision is caused by unsymmetrical curvature of the cornea. Astigmatism causes the rays to be focused unequally because one part of the cornea is curved more than some other part of the cornea. "Nothing appears clear to a person having a considerable degree of astigmatism. Distance vision is blurred and letters

¹

²Figure 14.

Hannum, Joshua E., "Eyesight Conservation Survey."

are confused and run together in reading."¹ To correct astigmatism (see chart ² with blue lines indicating rays of light in an astigmatic condition, and the red lines indicating rays of light passing through a correcting lens) it is necessary to measure the amount of difference in the two principal meridians of the cornea and use a cylindrical lens which, having power in but one meridian, compensates for the error without affecting the rays of light passing through the opposite meridian. In most cases, properly fitted cylindrical lenses can correct the difficulty in its entirety.

PRESBYOPIA: Failing sight due to advancing age is called presbyopia. The power of accommodation, the changing in the curvature of the lens of the eye for adaptation to the viewing of near and far objects, decreases with advancing age. The ciliary muscle which controls the expansion of the lens (it becomes thicker in viewing a near object) hardens with age and is less pliable.

"Even at 30 years of age, in strong eyes and healthy subjects, half of its power (power of accommodation of the ciliary muscle and the lens of the eye) is gone, and at 45 years, it is so weakened that small objects near at hand cannot be clearly perceived. At 60 years, accommodation is practically abolished." (Posey, William Campbell)³

¹ Hannum, Joshua E., "Eyesight Conservation Survey."

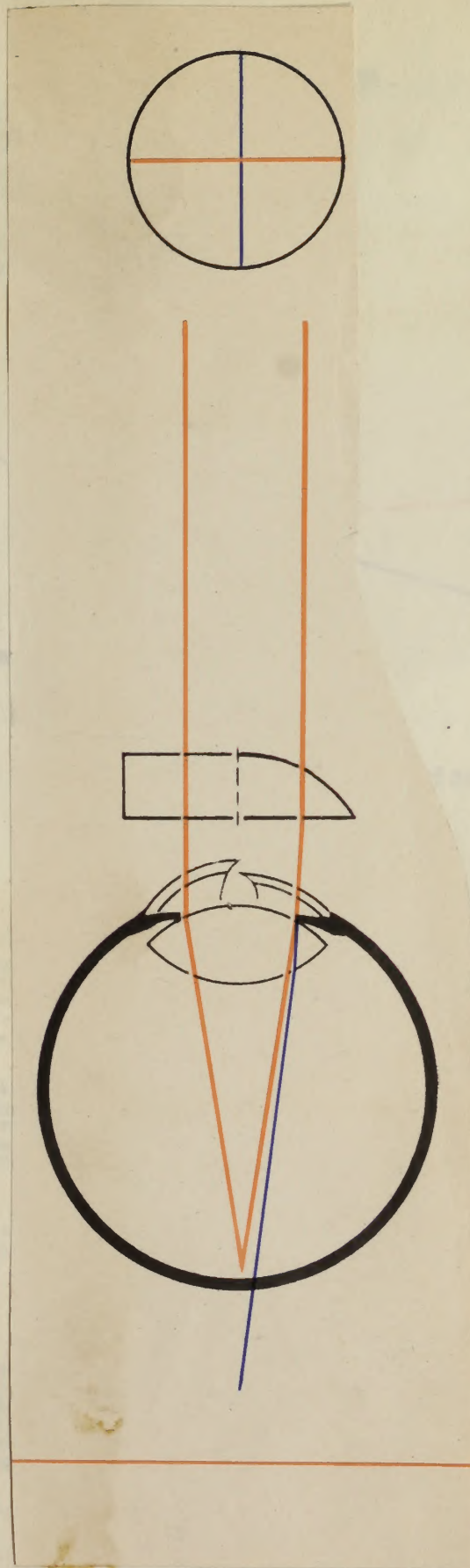
² Figure 14.

³ This quotation was taken from the quotation in "Eyesight Conservation Survey" by Hannum.

Figure 15

30A

CHART FROM
"THE EYE AND HOW WE SEE"
BETTER VISION INSTITUTE



ASTIGMATISM--Corrected by a
Cylindrical Lens

THESE ILLUSTRATIONS ARE FROM
 "THE EYE AND HOW WE SEE"
 BETTER VISION INSTITUTE

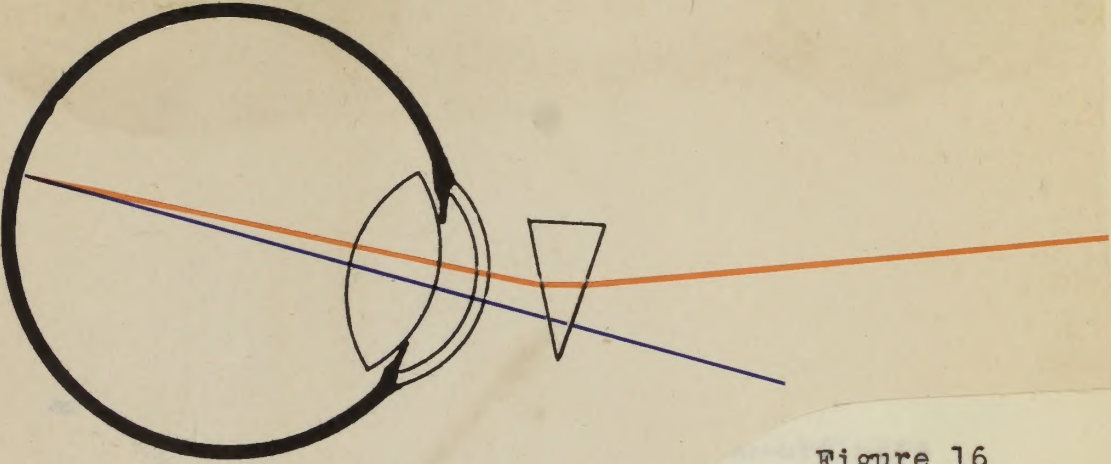


Figure 16

DOUBLE VISION--Corrected by a Prismatic Lens

COMMON EYE DEFECTS

Nearsightedness. This occurs when the rays of light are focused in front of the retina. The eyeball may be too long, or the lens of the eye too strong in refractive power.



Farsightedness. This occurs when the rays of light are focused behind the retina. It is most commonly due to shortening of the eyeball.



Astigmatism. The most common form of astigmatism is due to an unequal curvature of the cornea.



Double Vision. When the muscles of the eye fail to act in perfect harmony, the eyes become crossed. Then the image falls upon a different spot in each retina, and the object is seen double.

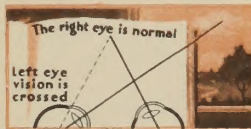


Figure 17

Illustrations exaggerated to show the principle.

DOUBLE VISION, Of the charts that illustrate the condition
CROSS-EYE:

of double vision (there is a large¹ and a small chart²) we can see the problem perhaps more clearly in the smaller chart. The dotted line from the left eye represents the normal focus of the eye. Since, however, in this illustration the left eye is crossed, the focus is out to the extent indicated by the dark solid line that runs from the retina of the left eye. A prism lens bends the light in such a way that rays of light from an image will focus correctly and in the same place on the retina of both eyes. When the muscles of the eye co-ordinate and work harmoniously and normally, both eyes are moved to the same extent at the same time. If one muscle is weaker than the others, the muscles are out of balance, and the effort required to keep the eyes in alignment causes eyestrain. If the strain is of sufficient degree "cross-eyes" will be produced. The technical term for cross-eyes is strabismus. It is especially curable in children, and unless it is cured, the vision is liable to great impairment because of the fact that the person who is cross-eyed tends not to use the crossed eye in an effort to see clearly.

1

Figure 16.

2

Figure 17.

CHAPTER IV

MANUFACTURING PROCESSES

The two essential parts of a pair of eye-
 OPTICAL GLASS glasses are the lenses and the frames. We
 AND LENSES: shall consider each in turn, but before the
 lenses comes the making of the optical glass. It requires
 special ingredients and special care in the making; it is
 inspected and reinspected at every step of the way. Truly,
 the name of "Glass Magic" which has been given to a moving
 picture, produced in their factory by the Bausch and Lomb
 Optical Company, is well chosen. The thrilling furnaces
 and the skilled and brawny workmen and the gleaming and
 perfect finished product make one almost wonder if there
 is really no incantation that goes into the process. We
 are assured, however, that it is only painstaking mathe-
 matical precision and planning and constant inspection
 that makes a finished product of such perfection and
 flawless beauty.

It takes several months for the large clay
Crucibles: pots to be made and air-dried for the melt-
 ing of glass.¹ They are artfully and slowly
 built on the special molds prepared for that purpose, and

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Mr. George Billick of the Soft Lite Lens Co. of New York
 City estimates that it takes four months.

then annealed carefully. If the pot does not stand the rigid inspections to which it is subjected and the pressure and heat to which it is submitted, the process must be started all over again. In "Glass Magic" and the "Eyes of Science," two moving pictures that show the process of the manufacture of glass, there is depicted a large room where skilled workmen are carefully building these clay melting pots. The pots are in several stages of progress, so that they may be finished as needed; and it takes a man two weeks to build one.

When the pots are finished, the ingredi-
Ingredients and ents of glass--sand, soda, lime, potash,
First Processes: lead, borax and barium--are accurately weighed out and mixed in great revolving turbines. Using gas heat, these ingredients are put into the pots and melted at 2600 Degrees Fahrenheit. The glass is stirred in these large crucibles until it seems to be entirely fused. A proof of glass is then taken by inserting in the crucible a large ladle or spoon-like device and extracting a sample of the molten ingredients. The sample is cooled and examined carefully to see if it is the right consistency and ready for the next process. In order to be considered satisfactory, the glass must be entirely fused without any unmelted particles. If the proof is not satisfactory, the glass must be further heated before being poured.

Giant tongs on wheels, that take several men for their operation, now move up into position and firmly embrace the crucible in the oven, removing it from the flames and heat. The glass is poured on a flat table and rolled to the required thickness. It is cooled and marked into squares. It is inspected, and generally only one-third of it passes this initial inspection.

The glass that has passed the inspection is separated along the marked lines by operators who tap on the markings with a little hammer. Splinters of glass fly in all directions, but, although the operators do not wear gloves, they seem skillful enough not to get their fingers cut very often.

The squares of glass are weighed, inspected, and again heated in a furnace and are shaped by a machine into a round form known as a "blank." The glass goes through a second annealing process which sometimes takes as long as a week. The sharp edges left by pressing the blanks into a round shape are smoothed off by a machine that is operated by a woman, one of the few employed in this industry except for inspecting and packing.

In this country, about the only manufacturers who make the actual glass for optical use are the Bausch & Lomb Company of Rochester and the

Finishing Process:
 1 First woman worker in optical industry was thought to be employed by the American Optical Company in Southbridge, Massachusetts, about 1863 according to the "Southbridge Mass. News," Vol XI, No. 7, 1933.

Pittsburgh Plate Glass Company. All the other manufacturers of lenses start with the blank. Many of the wholesale houses carry only a limited stock of finished lenses in commonly called-for strengths, and have their own finishing plant on a small scale to care for special prescription business. Many of the retailers, whether they are optometrists or opticians, also have equipment for one or more of the finishing processes that they take care of themselves.

In the view of a large factory-scale finishing department, one sees banks of machines that are working with almost weird regularity and precision. A man goes up and down the long row and puts a drop of oil here and an adjusting touch there. Lenses move along an endless belt, and the human element comes in only in the devising of the machines, in the tending of the machines, and in the ever-present inspection. Mass production methods have made their way into the manufacturing of optical lenses as well as they have into many other industries.

In the smaller shop, the layman gets more of a chance to see the processes in detail, and on a small and apparently unhurried scale. Let us follow a guide through the finishing laboratories or "shop" as it is called of the Boston Office of the Bausch & Lomb Optical Company.

When there is a call for a lens of from one-
Stock
Blanks: eighth diopter up to three diopeters, the blanks,

already ground for the correct curvature, are in stock and have only to be polished and edged and mounted. When a deeper curvature is required, it is usually done in the shop. Deeper curves cost more because they increase the cost of production in time and in the amount of chance for breakage.

A girl makes out the orders, as they are received, on a special form provided for that purpose; and Orders Received: each order is put into a separate wooden tray together with the materials for the filling of that order. The trays are colored for convenience to indicate special divisions:

Red means rush.
 Yellow means time orders that must be ready at a certain time in the day.
 Green means orders are to be mailed.
 Brown means order for a special messenger.

The lens blank is attached to a steel tool Surfacing: that fits into a diamond machine or surface-grinding machine. This machine was invented only three years ago and replaces much surfacing that formerly was done by hand with the harsher abrasives. The lens is attached to the tool by melted pitch which acts as an adhesive and which can be later removed by immersing the pitch-coated lens in ice water. The pitch becomes brittle and can be chipped off easily with the hands.

The surfacing machine has a grinding wheel that is

made of copper, closely set with fine black diamonds. At the point of contact between the lens that is being surfaced and the wheel, there is a continuous spray of a special "cutting oil" constantly playing, all the time that the machine is in operation. The machine is adjusted by the operator for thickness, curve, and prism. When it has cut a lip, or in other words when it has worked half way across the lens, it automatically stops. The operator of the machine removes the lens, turns it over and the machine completes the process on the other half of the lens. It takes about three minutes for this entire operation; and when the lens has been surfaced in this way it has what is technically known as a "fine finish." That means that the lens is accurate so far as the curve and thickness and the prism is concerned, but that it has a dull finish. Instead of being transparent and highly polished, it looks like smooth, frosted glass.

As has been indicated above, the older method for surfacing the lens and acquiring the "fine finish" was by rubbing them with a harsh abrasive--some kind of emery for example or carundum. There are still some lenses that are made in this way when the machine is unable to handle them. For this method, a skilled workman has equipment, on a small scale, that looks like a metal pail or basin with a center spoke that revolves at a rapid rate of speed. On this center spoke is placed a

tool of the correct curvature, and, as before, the blank is attached to this tool by melted pitch. The abrasive (which comes in powder form) is put between the lens and the tool that is attached to the quickly revolving center spoke. The abrasive has been mixed with water until it is of a paste-like consistency and can be easily applied by means of a long-handled brush. When a certain amount of the lens has been worn away, the operator carefully marks the lens with a special ink and measures it with an ordinary ruler to determine whether or not it is time to take it on to the next process. The measuring is done automatically, however, in the new diamond surfacing machine which is equipped to handle practically all of the lens jobs that come in.

The second major operation of lens-finishing Polishing: is polishing, which is effected by a machine similar to the hand machine used for surfacing.

There is a metal pail to catch the slops, and this time, instead of being electrically connected through the bottom of the pail, the revolving spoke comes down from above. To the spoke is attached the tool that holds the lens which has been taken from the surfacing machine. By the melted pitch, it is still fastened on one side to a steel block. The other side, of course, is ready for immediate submission to the polishing process. The abrasive used here is a fine white rouge mixed with

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water to a paste-like consistency. The tool has the exact curvature that will be given to the lens; it may be spherical (either concave or convex) or especially adapted to the grinding of cylindrical lenses. As the curve of the lens increases, the tool becomes smaller. The tool is made of metal and has a special felt-pad covering that is necessary because the glass can not be polished if held directly against the metal. This pad is of uniform thickness; and since it is replaced when worn, does not affect the curvature of the tool.

When the lens comes from the polishing machine, it has a smooth, shiny surface; it is as large and round as the original blank, and has the correct curvature. Sometimes a lens is ground for curvature on one side--say to correct farsightedness; and on the other is given a cylindrical curve to correct astigmatism.

The machine for polishing lenses and giving them a cylindrical curve also uses white rouge as an abrasive. The wheel (at the end of the spoke coming down from above) instead of merely holding the lense down to the felt-covered tool rotates with a sort of all-over motion. In some instances, where the prescription

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The white rouge that is used for the finishing processes comes in large barrels and looks very much like bleached wheat flour. It is about the same texture as the fine red rouge that is so extensively used in polishing, but is much more clean to handle and use.

requires, it is a figure-eight motion. It is done at such a high speed, however, that to the lay onlooker, it seems that the machine is subjecting the lens to a kind of general and aimless rubbing in all directions.

The glass lens together with the pitch adhesive have become heated somewhat by the friction of the polishing process; and now they are plunged into a shallow tray of ice water. This hardens the pitch so that it becomes brittle and can be readily removed from the lens. The lenses now are inspected carefully for axis, power, general defects, and polish.

Before the actual edging, the lenses are cut to Edging: their approximate size and shape--round, oval, or special fancy-shaped such as hexagon, octagon, or a combination design of angles and curves. The lenses now have a rough edge on which one might cut himself; and the edging finishes them off smoothly.

The machines that edge the rimless glasses have a steel patent (a piece of metal that is the exact size and shape of the lens as it is finally to be). This patent controls the set of the machine so that it automatically shapes the lens by holding it against an emery wheel (constantly lubricated by a tiny stream of flowing water) until just enough of the lens has been ground away by the friction.

The machines that finish the lenses that are to go

into frames are called bevel-edging machines. Here the abrasive seems smoother than the one used in the machines for edging rimless glasses--it is of a light buff color rather than the dull gray of the emery. Again we have the constant flow of water on the grinding wheel, and the automatic set of the machine.

For rimless glasses, small holes must be drilled for the attaching of the bridge and the temples. This is done on a machine that has a revolving wheel (naturally very small in diameter) that drills a hole in the lens. Finally the lens is mounted into the frame and finished off with fancy lugs or screws. In some of the newer mountings, the glass lens is attached to the mounting with a cement which makes it unnecessary for any screws or lugs to be used, and which eliminates the process of drilling small holes in the lens.

The final process consists of a man who inspects again for curvature and for general accuracy and a girl who inspects for scratches, cleans up and wipes off the lens, packs it, bills it, and places it in the right tray for shipping.

The mailing desk is in charge of a woman. All of the other processes, except the packing and some of the inspection, are entrusted to skilled men operators.

The most recent bifocal is the fused bifocal.

BIFOCALS: It is permanent, light in weight; and the reading area is almost invisible. The one-piece bifocal is also very practical--both the distance and reading fields are fashioned from one piece of hard glass. These have practically supplanted the "cemented wafer" type of bifocal, although the latter are still sold to and demanded by the patient. In the great majority of cases, the dividing line between the reading and the distance lens can be practically invisible, but in some cases the peculiar requirements of the prescription make a slightly perceptible line necessary if the patient is to benefit to the fullest extent from his glasses.

"In 1899, John L. Borsch of Philadelphia invented the cemented Krytok lens which was the first of the successful invisible segment bifocals. This lens comprised three elements--a major lens into which a depression or 'countersink' was ground, a flint glass reading portion so ground as to fit exactly the depression in the major lens, and a cover-glass which was cemented over the entire segment side of the lens, covering both distance and reading portions. There were several very serious drawbacks to this lens. It was heavy and thick. It was very difficult to produce, with its numerous surfaces, some of which had to be ground to knife edges. It was only a cemented lens, and the cement was prone to fail in either very hot or

very cold weather."¹

"About ten years later the son, John L. Borsch, Jr., succeeded in welding the flint glass reading portion into the depression of the major lens by placing the two together and heating both to such a temperature that the flint glass (which contained lead) melted slightly and fused into the countersink in the major lens; whereas the crown glass major lens, with its higher melting point, was not affected. He then omitted the cover-glass, of which the chief function in the cemented Kryptok had been to hold the lens together, and finished the lens by grinding and polishing the segment side with a continuous surface exactly like that on a single vision lens.

"For years this fused bifocal has been marketed under the trade name 'Kryptok,' and it has proved to be the most popular and widely used bifocal ever designed."¹

There have been further improvements of this type of lens to avoid the effects of chromatic aberration of the showing of a considerable amount of color that affected the clearness of the image in lenses of higher refractive index. This was done by the use of a new glass called dense crown glass. Another difficulty to be remedied is making the optical image clearer in spite of the fact that the highly polished surfaces at the interface of

¹"Modern Bifocal Lenses," Bausch & Lomb Optical Co., Rochester, New York. Page 31.

the flint glass and the crown glass do suffer some distortion at the fusing temperature, and this impairs the quality of image which the lenses are capable of giving.

Modern frames are made of almost all kinds of
 FRAMES: material: precious and semi-precious metal, zylonite, sterling silver, solid gold and filled metal. About 75% of the glasses sold today are "rimless." That means that they have temples (pieces that go over the ear and along the side of the head) and bridges (the cross-section over the nose). These are attached to the lenses, which are frequently of a fancy shape, by screws that go through special holes in the lenses that have been made to correspond with similar "tapped" or screw-threaded holes in the connecting metal parts.

The second most popular type of frame is the metal frame consisting of the three main parts: temple, bridge, and eyewire (rims around the lenses).

The American Optical Company at Southbridge, in the making of solid gold frames and gold-filled frames, not only makes the frames, but also melts the gold and makes the wire from which the frames are made.¹ Some factories only specialize in making the wire which, in many different shapes and thicknesses, is used for the making of the

¹
 "The Story in a Pair of Spectacles," reprinted in part from "The Book of Wonders," second edition with permission. Copyright, 1921, American Optical Company.

frames. Other establishments, which still call themselves factories, have all the parts of the frame made on the outside and simply assemble the frames--even sending them out to a special plant for the final plating and polishing.

It was the good fortune of the writer to spend several hours in a plant where sterling silver and eighteen per cent nickel-silver, rhodium-plated frames are made.¹ The frames are made in about eighty processes, employing the aid of powerful, electrically driven presses, polishing machines, electro-soldering machines, and "rattlers" or a sort of special washing machine. To go into the detail of all the eighty processes, many of which are two-in-one or even six-in-one processes, would require a technical and mechanical experience and training far beyond that of the writer and far beyond that of the average lay reader. One may, however, attempt to summarize sketchily some of the major and more interesting steps in the making of a metal frame.

The trade name for the part of the Temple and Butt: frame that extends from the outer edge of the lens along the side of the head and terminates either in a little crook or bend just behind the ear or curls all the way around the back of the ear is known as a bow or temple. Modern usage no longer favors the use of "bow" to mean the

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Stanley Gopen Optical Works, 845 Washington Street, Boston, Massachusetts.

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Temple and Gate: Frame that extends from the outer
 edge of the lens along the side of
 the head and terminates either in a little hook or
 bend just behind the ear or curls all the way around
 the back of the ear is known as a bow or Temple. Modern
 usage no longer favors the use of "bow" to mean the

joining across the nose, although in early literature this was a common meaning. The temple that is straight or has a little crook at the end and does not reach all around the back of the ear is called a skull temple and is a little more simple in its construction than the temple with the spiral or cable end. The springy spiral end of the temple is made by winding together first five wires in one direction and then four more wires in the opposite direction. The machine for this process is fascinating. There is a large coil of wire which is the central hub, and four smaller spools of fine wire, which when the power is switched on whirl around and entwine themselves with a remarkable speed and precision.

The wound spring is a bit rough, but this is soon remedied by "swedging" an automatic process which smoothens the wire and reduces it to the size called for in any particular specifications. Another machine cuts it to the lengths required (about half the length of the finished temple which is anywhere from five to seven inches).

The front part of the temple or the part which goes from the eye half way to the ear is called the butt. It is made from wire that is swedged and reduced to the requisite thickness after it has been cut into correct lengths. The swedging leaves a little ball of metal at one end which is flattened, shaped by a power press, and

later pierced (so that a screw can be inserted), and trimmed. Trimming here means that a little nick is cut out so that the temple will have just enough swing without being bent too far back when taken out of the eyeglass case by the wearer. The butts are now put through a machine that further shapes them and engraves a plain or fancy design on the flattened section of the butt. The butt and the temple are joined by electro-soldering; and the raw end of the spiral is also soldered and finished smooth and round so that the nine wires will not uncurl.

In glasses with rims, the rims are known to the Eyewire: trade as the eyewires. They are made by winding grooved wire around a rod of the diameter of the finished eyewires and then running a saw along the length of the rod. Circles of wire, just the right size and open at one end, drop off. The sizes run from 34 to 44 millimeters in diameter.

Between the eyewire and the butt is a hinged End Pieces: piece, pierced and tapped for two screws.

This is known as an end piece and is blanked out (punched out or stamped out) from rolls of flat stock. The machine that blanks out the end pieces can make over 2,000 an hour. On a separate machine the end pieces are pierced for a screw and tapped (process of making threads for the tiny screws that fit into the holes). The end pieces are clamped on to the eyewire so that they are

held firmly while they are soldered for permanency.

The bridges are blanked out by a power press

Bridge: from flat stock or they are made by another

type of power press which shapes them from wire and cuts them off to just the right size. The bridges, in either event, are flat and must be bent and smoothened. They are then soldered on to the eye-wire.

On either side of the nose, most of the

Pads and Arms: recent types of frames have two small pads. These rest lightly against the nose and do not leave the unsightly and uncomfortable marks of the old-fashioned bridges which fitted tightly down on the nose. They may be made entirely of metal, but the more recent models are made of "shell."

Strips of celluloid in white or a pastel color (usually pink) are blanked out by a tool that makes the little pads. Another machine makes the metal backing for the pad and the two parts are attached by a combination process of heating and accurately directed pressure.

The arms are the joining pieces of metal between the eyewire and the pads. These are soldered to the eyewire when they have been made, and attached on the other side to the metal backing of the pad. The arms have been so perfected in their mechanical construction

that a little play is allowed and the pads instead of being rigid "rock" a little and are therefore more flexible and comfortable.

Of course, the whole process of making the Finishing: frame is thought of as the finishing. By this subheading, however, the writer refers, perhaps without being technically correct, to the polishing and washing processes to which the frame is subjected throughout the long manufacturing processes, as well as the countless inspections and hand adjustments. There is polishing on huge electric machines that use red rouge as the abrasive. There is washing in chemical solutions to remove every particle of dirt and oil so that each of the solderings will be strong and permanent. There is a tubing process where the parts to be tubbed are strung on an instrument that looks like a tremendous wooden safety pin and placed in a container which is partially full of steel buckshot. The container is closed and submerged in a tub of frothy soapsuds where it whirls around and around until the friction of the buckshot and the cleaning action of the water has removed every particle of dirt from the frames. The frames must be dried in warm sawdust and again washed and polished, trued, packed, boxed and put in stockroom.

The temples for the rimless glasses are made Rimless: in the same way as the other temples, but the

design may be varied. The process for making the bridges and the end pieces is substantially the same. The main difference comes in the joining of the endpieces on the one hand, and the bridges on the other, to the lenses which are not encased in the eyewire. This calls for an extra part called a strap--and, varying with the patented design of the manufacturer, it may be more or less complicated. Most of the lenses are attached by having holes drilled in the outer and inner edges so that a screw may be inserted to join the lens and the connecting strap. In some makes, introduced within the last few months, the drilling of holes in the lenses is eliminated by a new type of joining that combines cement and a clamp device.

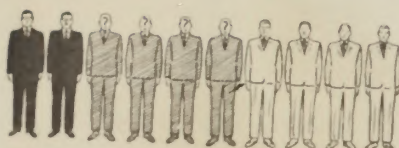
CHAPTER V

AVAILABLE AND POTENTIAL SPECTACLE MARKET

In the selling of any service or item
 INTRODUCTION: of merchandise, it is only sensible to
 consider whether or not a large number
 of potential clients are benefiting by the service; and
 whether or not a large number of the potential customers
 are buying the merchandise. Since the discovery of astig-
 matism in 1801 by Thomas Young (see Chapter II) the num-
 ber of persons helped by wearing glasses to relieve eye-
 strain has increased from a practically negligible num-
 ber to many millions in the United States alone. It is
 the purpose of this chapter to give the reader some idea
 of the number of people in this country wearing glasses;
 the amount of money spent for glasses; the amount of
 money and human energy wasted by not wearing glasses;
 and the possibilities of increasing the prospective
 customers for glasses and the volume of business in the
 optical industry.

The possibilities in the Spectacle Market are
 TWO OUT shown by Figure 18, a pictorial graph: Two
 OF TEN: adults out of ten (or 20% of the adult popula-
 tion of the United States) now wear glasses. Adding

PHOTOSTATIC COPIES FROM "BULLETIN" OF
BETTER VISION INSTITUTE
August-September, 1931



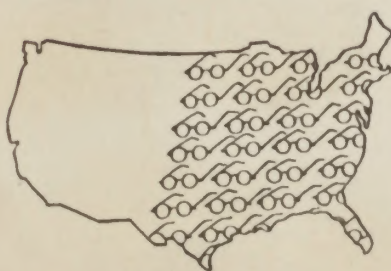
2 people in 10 wear glasses. 6 in 10 need them, part time at least. The optical potential is three times the present volume.

Figure 18



American industry loses \$50,000,000 annually due to the faulty vision of its workers.

Figure 20



65,000,000 people in the U. S. are or can be helped by glasses, part of the time at least.

Figure 19

PHOTOGRAPHIC COPY FROM "SERIES" OF
 HETTER VISION INSTITUTION
 August-September, 1951



Figure 20

Figure 18



Figure 19

another million children wearers, we have 21,000,000 persons who now wear glasses out of a total 124,000,000 population.

Further, Figure 18 shows that six out of ten people need glasses, or that the potential optical market is three times as great as it is now. Taking into consideration the fact that some 4,000,000 children, who are not now wearing glasses, could be helped by them we get a potential optical market of 65,000,000¹ instead of our present 21,000,000.

(See Figure 19.)

In the January, 1931, "Bulletin," the Better Vision Institute presented the results of a PAIRS OF GLASSES PER WEARER: house-to-house nation-wide campaign. Key cities ranging in population from 20,000 up were selected, and their localities paralleled in other population centers of the country. In each center five economic groups were investigated so that a representative cross-section of the whole country could be made. Only adults were interviewed, with ages ranging from twenty-one years up; and with the average age 40.2 years.

Most people were found to own only one pair, a few owned two pairs, and the percentage of those owning three or more pairs was very slight:

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In "Hygeia" for April, 1931, Fassett Edwards estimates that millions of people, in addition to those now wearing them, would be helped by glasses.

NUMBER OF PAIRS OF GLASSES OWNED
BY EYEGLASS-WEARERS

Number of Pairs	Percentage of Owners
1	63.1%
2	24.2%
3 and over	<u>12.7%</u>
	100.0%

It is a matter of common sense that an extra or emergency pair of glasses is a necessity, and the 63.1% of persons who only own one pair of glasses are a splendid potential market for eyeglasses. In the same consumer survey it was shown that although women were slightly more style-conscious, 71.7% of the people interviewed did not know that there were style factors. If, through educational advertising, these people could be made aware of the style factors in glasses, and of the fact that sports and dress costumes really call for glasses of an appropriate and matching design, we could improve our selling arguments and increase the possibilities of realizing sales of that second pair of glasses to the 61.3% of eyeglass-wearers who only own one pair.

Industrial surveys have shown that American industry loses \$50,000,000 annually due to ¹ ADDITIONAL PROSPECTIVE CUSTOMERS: the faulty vision of its workers. If protective goggles in industries where these were necessary were equipped with ophthalmic, corrective lenses, not only would the goggles be more effective in saving the eyesight of the workers and in insuring them greater comfort, but more prospective customers for spectacles would be turned into actual customers. Figure 20 is a pictorial graph that shows the 50 million dollars taking flight--shows the 50 million dollars dead loss to American industry. It could well be used as an effective illustration for publicity advertising to be sent to industrial employers. Perhaps they might then invest in eyeglasses for their workers; no one likes to have dollars lost in his plant!

Figure 21 is a composite picture made up of several attractive illustrations suggested by Better Vision Institute for use with advertising directed toward cultivating the potential optical market. Movies are a strain on the eyes, and the one hundred million weekly movie-goers should be better equipped with restful, helpful glasses.

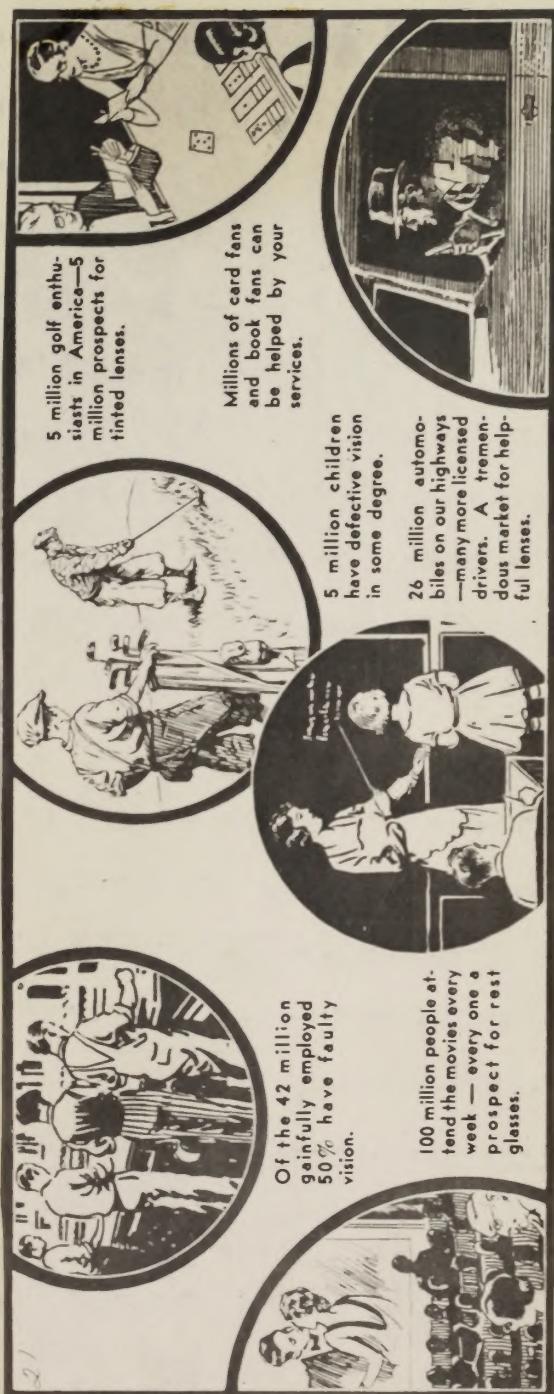
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"Eyes in Industry," an article in the "Review of Reviews" sponsored by Better Vision Institute and referred to in the August-September, 1931, Better Vision Institute "Bulletin."

MARKET INCREASED BY DIRECTED APPEAL TO SELECTED CONSUMER GROUPS

Figure 21

Photostatic copy from "Bulletin" of
Better Vision Institute, August, 1931



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Fassett Edwards¹ in "Hygeia," a publication of the American Medical Association, comments on conditions in a cloisonne factory in Japan. He visited there and found painters who were doing extremely fine work--"painting a thousand separate and distinct butterflies on a piece of porcelain not much larger than a dollar."¹ Upon inquiry, he found that the maximum age to which the painters could continue their work was forty years of age. "The advance of old age and failing sight retires them involuntarily when they are probably at the acme of artistic skill. The use of glasses would easily extend the work period from fifteen to twenty years."¹ If we consider the many other industries where good sight is of great value, the statement that, of the forty-two million gainfully employed persons, fifty per cent have faulty vision seems high.² The estimate is, however, undoubtedly conservative.

School children with defective vision show up every year in the examinations that are given by the teachers. In Massachusetts, notes are sent home to the parents indicating that defective vision exists, but nothing is done to check up on having the eyes of the child professionally refracted and glasses fitted. Furthermore, there is no test by the teachers for far-sightedness, crossed eyes,

¹ "Those Glasses We Wear" by Fassett Edwards in "Hygeia"--April, 1931.

² Figure 21.

or astigmatism--all that the cards test is myopia or near-sightedness. In my opinion, and I as a teacher have tested eyes in the prescribed fashion, the value of such a check is negligible when no further follow-up is made. It is, furthermore, not adequate since the teacher is inexperienced in her work; and the time allotted to each case (about one minute or less when one takes a few seconds off for the record-making) is not sufficient for even an experienced optometrist to make satisfactory findings.

The potential market for eyeglasses among school children should be developed by compulsory eye examinations in the schools given by competent persons; and by advertising directed toward the parent market. Such examinations could be made in connection with reputable clinics if funds were not available for examination that was paid for by municipal tax funds. The children would be benefited by being more comfortable and less subject to eyestrain, as well as having more of an opportunity to work up to their full capacity of scholarship. There is a definite relationship between retardation or apparent dullness and defective eyesight. These children, furthermore, get the habit of wearing glasses and are prospective customers, as they grow older, for repairs and for replacement of frames and lenses that become too small or outmoded.

In the realm of sports, especially golf, there is

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or unbroken.

replacement of frames and lenses that become too small

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amateurs could be made in connection with reputable

advertising directed toward the parent market. Such ex-

tions in the schools given by competent persons; and by

children should be developed by compulsory eye examina-

The potential market for eyeglasses among school

optometrists to make satisfactory findings.

record-making) is not sufficient for even an experienced

minute or less when one takes a few seconds off for the

in her work; and the time allotted to each case (about one

furthermore, not adequate since the teacher is inexperienced

is negligible when no further follow-up is made. It is,

eyes in the prescribed fashion, the value of such a check

sightseeing. In my opinion, and I as a teacher have tested

or satisfaction--all that the cards test is worth or near-

a market for glasses that are a protection against glare and are fitted with ophthalmic corrective lenses. A golfer, if properly approached, is just as likely to buy a pair of tinted glasses to improve his game as he is to buy a new golf stick.

With over a quarter of a million automobiles on the road, and with accidents as prevalent as they are, an appeal to the primitive instinct of self-preservation should help to realize the potential market for the sale of glasses to motorists. In a recent newspaper clipping,¹ Dr. Matthew Luckiesh, Director of Electric Light Research Laboratories, made the statement that "annual casualties attributable to poor vision exceeded the casualties of the American Army during the World War."

Of the eyeglass wearers interviewed in the consumers' survey,² 61.5% did not object to wearing glasses.³ "This is a significant indication of the changed attitude of the public towards glasses. Of course the non-wearing group is not affected by this finding. The 21-30 age group objected exactly twice as much as the 51-60 age group, which seems to prove that the prejudice towards glasses lessens with advancing years."² In

1

The date and source of clipping were obliterated.

2

"Bulletin" -- January, 1931, Better Vision Institute.

3

If more school children were educated to wear glasses when eye defects indicated their necessity, perhaps the percentage of people objecting to wearing glasses would be even less.

thinking over these figures, it is reasonable to suppose that at least 20% of the 38.5% who do object to wearing glasses could become better customers if they were educated to the fact that glasses can be purchased that are comfortable, stylish, and becoming. Furthermore, there must be a great many people who are not wearing glasses, and who would be benefited by them, that could be convinced that glasses would be comfortable and becoming. Here is another market to explore.

So far, we have been thinking of the potential spectacle market, contrasted to the actual spectacle market, in terms of pairs of glasses and numbers of prospective customers. There is another angle--the consideration of the market from the point of view of the latent dollars and cents that could come into the industry if the potential market were realized.

A 10% increase in the two-pair-owner-market would increase the present volume of business by \$10,000,000 according to a Better Vision Institute estimate. In Figure 22, there is a pictorial graph that should stimulate the distributors of glasses to cultivate the two-pair market. It is obvious that the owner of a second pair has many advantages.¹

In rough figures, the 20,000,000 people who wear

I

For reasons, see preceding section in this chapter, "Pairs of Glasses Per Wearer."

PHOTOSTATIC COPIES FROM "BULLETIN" OF
BETTER VISION INSTITUTE

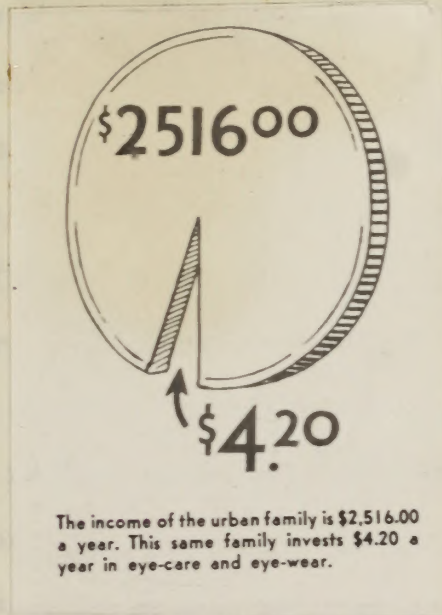


Figure 23

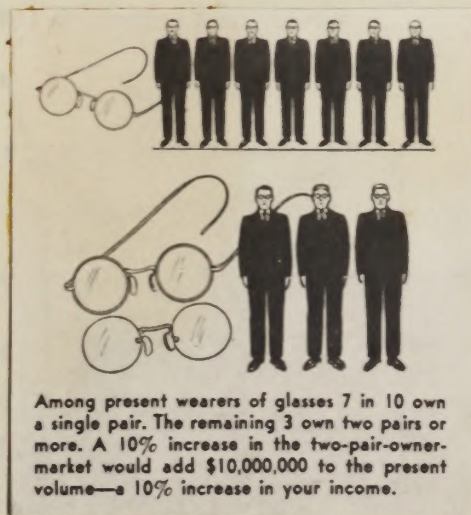


Figure 22

glasses spend \$100,000,000 for eye-care and eye-wear.¹
 This is \$5.00 per wearer per year. "Now then, in view
 of the fact that one person in five wears glasses, the
 per capita investment is therefore approximately \$1.00
 per year. The income of the urban family, consisting
 of 4.2 persons on the average, is \$2,516.00 per year--
 and this family invests \$4.20 a year in eye-care and
 eye-wear."¹ (See Figure 23.)

In a chart, especially prepared by the United States
 Department of Commerce for the Better Vision Institute,
 and published in the "Bulletin" for June-July, 1931,²
 the division of the income of the residents of Washington
 and Chicago was depicted. It was based on the actual dol-
 lar distribution in Washington and Chicago during the year
 1930. It was found that the people of Washington and
 Chicago² alike invest approximately 1/10 of 1% of their
 income in their eyes. In other words, 1/10 of every cent
 goes for eye services and merchandise. Is this adequate?
 Let us compare our annual expenditures as individuals:
 On an average, we spend less than \$1.00 a year on our
 eyes. At the same time, "we spend \$3.00 a year for
 chewing gum, \$41.00 for dentistry, \$52.00 for gasoline
 and automobile upkeep, and \$84.00 for cosmetics."²

¹
 "Bulletin" --Better Vision Institute, August-September,
 1931.

²
 "Bulletin" --Better Vision Institute, June-July, 1931.

As industries go, the Optical Industry
RECOMMENDATIONS: is not large either in its volume of
business or in its employees. For ex-
ample, in a survey made by the "National Industrial Re-
covery Administration," it was found that in the whole-
sale optical trade there was a total of only 4,276 em-
ployees. This included employees in shop operations,
clerks, messengers, salesmen, managers and assistants.¹
In the textile and clothing establishments, almost that
number of employees in the wholesale end of the industry
could be found in New York City alone. While the demand
for optical products can never come up to that of a major
industry like food or clothing, the preceding paragraphs
tend to indicate that there are potentialities in the
optical industry that have not yet been fully developed.
Advertising, directed at prospective-customer groups,
could add appreciably to the market, and thereby to the
dollar returns.

¹"Hearing on Code of Fair Practices and Competition"
presented by the Optical Wholesale Industry, December 3,
1933. Stenographic report by Jesse L. Ward of Ward &
Paul, Official Reporters, Earle Building, Washington, D. C.

CHAPTER VI

SOME TRADE PRACTICES

One of the reasons that persons connected with that part of the optical industry that deals in eyeglass frames and lenses are reticent and unwilling to talk about trade practices is the fear that the layman will misunderstand and misinterpret these practices. Not only the trade practices, but the attitude of the industry toward these practices is interesting.

Trade alliances and rebates, anti-social clinical conditions, lack of regulation of the sale of inferior or second-quality merchandise exist. When he is faced with the facts and can no longer side-step the issue, no one in the industry will deny they exist. In sheer self-protection, however, almost no one in the industry will permit his name to be used as authority for stating that such conditions do exist. The statements made in this chapter are based on interviews with reputable oculists, optometrists, opticians, and their representatives, as well as representatives of manufacturers, educational institutions, wholesale establishments, and hospital clinics. In the few instances where

permission has been granted to use the name of the person who has the proofs of these statements, due reference will be made. In other instances, because of promises made, sources of information will have to be withheld.

Perhaps the most common trade alliance is that between the optician and the oculist. The optician is a man who is equipped to sell glasses; and the oculist is a medical doctor who has specialized in the refraction of eyes and the treatment of diseases of the eye. The oculist charges the patient a fee for the examination of his eyes and then recommends him to a dispenser of eyeglasses. He may tell the patient that it is a reliable dispenser; that it is the only dispenser in the city qualified to fill the prescription; that the patient will get a lower rate if he mentions the name of the physician; or that all of the prescriptions of that oculist are filled by that optician.

In any event, the optician, after filling the prescription for the patient and fitting him to glasses, sends to the oculist a pro-rata amount. Sometimes it is a flat fee of five dollars for each patient sent to the optician by the oculist--and in that event an extra five dollars must be added to the price of each pair of glasses by the optician. Sometimes it is a percentage of the sale--and this practice encourages the oculist as well as the optician to try to sell the patient a more expensive pair of glasses when a less expensive

pair would be more in keeping with the patient's pocket-book and would be just as effective for purposes of correction and comfort.¹

It is not implied by the foregoing statements that all oculists or all opticians indulge in the practice of trade rebates; it is simply stated that this is a common practice and that it is not considered at all unethical. A leading educator (in training young men in methods of refraction) expressed his opinion that it was a rather poor way of getting business, but perfectly justified if the practitioner (oculist or optometrist) felt that it was the only way in which he could meet competition and increase his business.

In the eastern states of the United States, the dispensing optician is common. In the western states, the dispensing optician exists, but not in such great numbers. His place is taken, to a large extent, by the wholesale-retail establishment. This is a wholesale house that fills prescriptions for the retail trade when requested to do so. There is very little danger, however, that the price paid by the retail consumer-customer is lower than the price he would pay if there were available a regular retail establishment. These wholesale-retail houses keep regular accounts with the oculists. They credit to the account the total amount of the sale to a

1

Dr. C. G. Berger of Atlantic, Massachusetts, can verify some of the statements in this section, and has given permission to refer inquiries to him.

patient that the oculist has recommended, and subtract from the account the amounts charged to the oculist as the cost of material and service in fitting the patient.

If a refraction by a reputable oculist is worth, shall we say ten dollars to the patient, it is a pity that he can not pay the ten dollars directly to the physician rather than paying him five dollars and having another five dollars extracted from him by the dispensing optician to turn over to the oculist who sent the patient.

It must not be deducted that optometrists have SCHOOL CONDITIONS: lily-white hands when it comes to making trade-alliance arrangements. Their representatives would like one to think so, but a little careful questioning elicits the information that in New York City, at least, there exists an understanding between certain school nurses and optometrists. The nurses, upon examining the eyes of the children and finding some defect, send them to a certain optometrist who gives the child a more thorough examination, fits the child to glasses (presumably only when necessary) and sees to it that it is financially worthwhile for the nurse to make the recommendation. I have not heard of this practice in any other school system, and I have reason to believe that it does not exist in Boston at present.

Many of the hospitals in the larger cities have out-patient departments where the eyes ANTI-SOCIAL CLINICAL PRACTICES: of persons, who are not able to afford the

price of a regular refraction, are examined and treatment indicated. In some of the hospitals, the patient is charged some nominal clinical fee of twenty-five or fifty cents, given a prescription and sent outside to fill it. The patient may be recommended, if he so requests, to a retail dispenser. There is, as a rule, no ulterior motive in this recommendation. This type of a clinic is a real boon to mankind, and a truly charitable help to those poor unfortunates who are suffering from eye trouble and can not pay for honest eye-care.

In Philadelphia, there is said to exist a hospital clinic where the practice is to allow the patient to fill his prescription on the outside if he wishes, but where he is urged to fill it from the dispensing shop of the hospital at a considerable saving. It seems that the hospital, having no overhead and advertising and exorbitant operating costs to allow for, undersells the other retail establishments of the city. These retail establishments have protested bitterly many times, and have tried to suppress the competition of the hospital which they consider unfair. Definite information as to the final outcome of this battle is not available, but certainly there are arguments to be heard on both sides.

The anti-social clinic, however, is a species entirely different from the other two. In its outward appearance, it is deceitfully like the Philadelphia clinic--there is a charge for the eye examination that is very nominal.

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The anti-social clinic, however, is a species entirely different from the other two. In its outward appearance, it is deceptively like the Philadelphia clinic--there is a charge for the eye examination that is very nominal.

Instead of being urged to fill his prescription in the hospital dispensary, however, the patient is not given a prescription, but is told to come back for his glasses in a few days. He is not allowed to buy his glasses outside of the hospital shop. In this shop, which is run by some one who has leased the space and concession from the hospital, the patient, to use a mild term,¹ is exploited.

The prices which the patient pays for the glasses far exceed the prices at which the patient could buy glasses elsewhere. Furthermore, in these dispensaries, which because of their apparent connection with the hospital the patient has a right to assume would sell reliable merchandise, have been known to sell lenses of inferior quality which are actually harmful to the welfare of the patient's eye-comfort. When a patient is led to believe that an out-patient clinic is operating for the benefit of the patient, when that hospital accepts donations from private individuals in the name of charity, when in some cases that hospital is endowed with money raised by municipal and state taxes, it seems gross misrepresentation and anti-social practice to charge unnecessarily exorbitant prices for glasses. Such charges are not confined to clinics where space is rented out to some outside person, they are also true in other instances where the clinic is operated by the corporation of the hospital and as an integral part of the eye-examining department of the out-patient clinic.

CHAPTER VII

TRADE JOURNALS IN THE OPTICAL BUSINESS

There are three trade journals that are of greatest importance in the optical industry, and a host of less important house organs of prominent manufacturers and distributors and organizations.

These are:

- (1) "Optical Journal and Review of Optometry"
- (2) "Western Optical World"
- (3) "Optometric Weekly"

The one that is looked upon generally as most authoritative and perhaps the leading one in the field is the first, but we shall consider each of them in turn.

"OPTICAL JOURNAL AND REVIEW OF OPTOMETRY": This magazine is published by Jewelers Publishing Corporation, controlled by

United Business Publishers, Inc., 239

W. 39th Street, New York City. When I visited the office of the publishers last summer, I found the editor and his assistants most cordial in helping me to obtain from their files the information that I wished to have. They are genuinely interested in the welfare of the industry, naturally; and have, it seems to me, the finest magazine in the industry.

The articles are educational and written both from

the point of view of the optometrist and the optician. Many of them are even contributed by oculists. There is a welding of all the factions of the industry into a more or less harmonious whole--or at least there is no apparent exclusion of any interest as there is bound to be in either a house organ or in a publication issued by some organization (as for example "Guildcraft").

The publication reflects impartially the trends of the times and tries to get all the current news of interest to the manufacturer, retailer, and wholesaler, and eye-physician into each issue. There are articles on better sales methods for the retailer; there are articles on figuring the cost of various departments in a complicated wholesale establishment; and articles on new methods of examination and new case studies in the field of refraction.

When there was a great deal of controversy concerning the adoption of codes for the Optical Industry, by actual count, this publication had more square inches devoted to discussion of code developments than had any
¹
of the others.

An illustration of the impartiality and open-mindedness of the publication is the way in which the problem of the "professionalism" of the industry is handled. There is, at present, a marked tendency on the one hand for optometrists to stress the professional and service

¹ Computation made by "Optical Journal and Review of Optometry."

aspects of their calling. They are moving into upstairs offices and minimizing the merchandizing aspects of fitting patients with glasses. On the other hand, there is a tendency for the merchandizing aspects of the fitting of the patient with glasses to be stressed by such concerns as Eyeglass Departments of the Kresge Chain, the Department Stores, and Chain Opticians like M. H. Harris of New York. On one page of an issue of the "Optical Journal and Review of Optometry" you will find an article written by a man who is interested in fostering commercialism in optometry. He will give pointers on how to merchandise goods successfully and how to make more money. On the very next page will be an article on the professional aspects of optometry, and an exhortation for optometrists to be altruistic in upholding the idealism of their profession.

The advertising rates are the same as those of the "Optometric Weekly" and more than those of the "Western Optical World." The information as to the rates and qualifications for advertisements will be discussed in Chapter 9.

In figures from the "Standard Rate and Data Book," October, 1932, there is the information that the "Optical Journal and Review of Optometry" was established in 1890. Single copies are ten cents; and the yearly subscription rate is \$2.00. The total net paid circulation on June 1, 1932, was 6,815; and the total distribution in June, 1932,

was 7,360. The magazine is published on the first and fifteenth of each month.

"OPTOMETRIC WEEKLY" The "Optometric Weekly" is published weekly

by the Professional Press, Inc., 5 N. Wabash Avenue, Chicago, Illinois. It is a smaller publication than the bi-monthly "Optical Journal and Review of Optometry." It is not as popular in this section of the country as the New York publication, but is more generally subscribed to than the "Western Optical World," which seems to be more distinctly a Western paper. The general make-up and size of the magazine is much the same as that of the "Optical Journal and Review of Optometry," with the exception that the cover is in black and white with a design, while that of the "Optical Journal and Review of Optometry" is colored--a different color each month, and frequently changing cover designs.

The advertisements are, on the whole, more catchy and less conservative than those in the "Optical Journal and Review of Optometry."

"WESTERN OPTICAL WORLD" The articles and construction of the "Western Optical World" are very much like those of the

"Optical Journal and Review of Optometry." In fact, one frequently finds that the same article--especially one that has to do with some special medical improvements in refraction methods--published in all three of these magazines. I do not know just what the arrangement is with the author or publishers, but one can find

such duplication, as well as the duplication that one would expect in news of conventions and news of personal interest to members of the Trade.

The prices of advertising in the "Western Optical World" are the same as those of the "Optical Journal and Review of Optometry" but the circulation is confined more to the western part of the United States than to general or Eastern United States' circulation. As a matter of fact, it is rather rare to find a subscriber in the Eastern cities. "Western Optical World" is published monthly by the Optical World Publishing Co., Box 210 Arcade Station, Los Angeles, California. According to the "Standard Rate and Data Service" they refused to¹ give circulation figures upon three requests.

"GUILDCRAFT": Published by the Guild of Prescription Opticians of America, Inc., 705 Bailey Building, Philadelphia, Pennsylvania, "Guildcraft" is an example of an association publication. It is published every two months and carries advertising matter. It is much smaller in size than the other magazines referred to above, being only eight inches long and five and one-half inches wide. The articles are those written by the members of the organization, and "Guildcraft" makes the following statement about them: "Guildcraft," although formally accepting and publishing articles and letters of its readers,

¹ "Standard Rate and Data Service," January, 1935.

does not hold itself responsible for the opinions, theories or criticisms contained therein, except when otherwise decided by special resolutions.

The advertisers seem to be, from the sample copies that I have seen, exclusively manufacturers of ophthalmic merchandise.

CHAPTER VIII

OUTSTANDING ASSOCIATIONS

In the Optical Business the trade organization is both horizontal and vertical as well as sectional. By horizontal organization, is meant the associations comprised of members all of whom are on the same level of service. Thus we have retail, wholesale, manufacturing, optometric, and medical associations, each of which is presumably national in scope. Sectional organization refers to some local organization such as the Essex County Optometric Society which held a meeting last summer in Newark, New Jersey. Vertical organization is that type of organization in which all members of the industry should be interested, no matter on what level of distribution they may be. The Better Vision Institute is an example of a vertical organization. The National Recovery Administration, although it undoubtedly aimed at the unification of all interests in the industry, was organized horizontally: separate codes were set up for the manufacturing, the retail, and the wholesale divisions of the industry.

Perhaps the most important of the vertical organizations, and certainly the only one now functioning actively, is the Better

BETTER VISION INSTITUTE:

Vision Institute. It was founded to protect the optical industry from inroads of other industries.¹ The offices are in the Rockefeller Plaza in New York City, and are in charge of the President, Mr. M. J. Julian. The membership fee is \$5.00 a year.

The members are from the ranks of manufacturers, wholesalers, opticians, and optometrists. There is no restriction that I can find against the inclusion of oculists as well.

In return for the membership fees, the members receive, at monthly intervals, the "Bulletin" which contains the results of surveys of market conditions as well as many advertising hints for the member who is interested in cultivating the market by so-called "educational advertising." These advertising layouts with the accompanying cuts for illustrations, and good text are excellent and can be adapted to any space that the member wishes to use. Other publications, such as "Fashion's Glass" or "The Eye and How We See" or envelope stuffers and brochures are additional services. Some of the publications, if they are to be used in large quantities for distribution, are sold to members at a moderate cost. Any of the publications are always available to members without cost if they need only one or two copies for information and for their files.

Radio broadcasts, and articles in some of the popular

¹

"The Western Optical World," May, 1933, page 366.

magazines like "Review of Reviews" or the "Saturday Evening Post," as well as articles of optical-educational interest in the newspapers of the country are another feature of the Better Vision Institute service.

Emergencies in the industry always elicit the immediate and whole-hearted cooperation of the Institute even if such emergencies are not entirely within the educational realm of the Institute. For example, when the various Optical Code Hearings were being held, Better Vision Institute was on hand with data and facts that the Institute had collected so that the interests of its members might be protected.

If it were not for the cooperation and encouragement of the Better Vision Institute, this paper might never have been written. At the point when the writer was most disappointed and discouraged by the non-cooperative attitude of some of the individual members of the industry, information and encouragement, coming from Better Vision Institute, made it seem possible to go ahead.

The latest development in the work of the Better Vision Institute is cooperating with the newly formed "Better Light Better Sight Bureau." This latter is an organization made up of optical interests, paint and wall-coating interests, and electrical interests. They are beginning to disseminate propaganda in the form of advertisements in popular newspapers and magazines. The ones that I have seen in the "Saturday Evening Post"

have been those extolling the benefits of correct lighting to the eyes and have had the insignia of the Better Light Better Sight Bureau in an inconspicuous corner. Undoubtedly others which stress the other two angles will be appearing in the near future. It is a movement that will bear watching for future developments.

This is a national organization, THE AMERICAN OPTOMETRIC ASSOCIATION INC.: the membership of which is limited to optometrists. In reply to a letter requesting information to be used in the preparation of this paper, the writer was referred to wholesale opticians and manufacturers, adding: "You see Optometry is a profession dealing with the examination of the eye and the prescribing of lenses, and not interested in volume sales of eyeglasses, frames, and lenses."¹ It is the aim of this organization to consolidate into one group all of the optometrists of this country, so that they can present a solid body in case of necessity and so that they can cooperate in furthering the professional ideals and standards of optometry. At their conventions, they frequently have talks by eminent and forward-looking men and women in the field of optometry. They sponsor better education for the optometrist and the highest ideals of service.

Harold Kohn, attorney for The American Optometric

1

Quotation from a letter written to writer by Dr. Ernest H. Kiekenapp, Secretary of The American Optometric Association Inc. on August 11, 1934.

Association Inc. reported that in June, 1934, there were 7,057 paid-up members of that association. Judging from the enrollments of members of previous years, he estimated that there would be 9,000 paid-up members before the end¹ of the year. He said that the association was made up of local, state, and national chapters. The nation headquarters are in Faribault, Minnesota.

This is an association with which Doctors AMERICAN MEDICAL of Medicine affiliate. There are, in ASSOCIATION:

addition to general practitioners and members who do some work with the eye, those who specialize in the eye or the eye, ear, nose and throat. There are no figures available that show separately the number¹ of oculist members. An estimate made by Harold Kohn is about 7,000 members. The American Medical Association does not have statistics upon which to base an estimate. The magazine of the American Medical Association, "Hygeia" has articles that are of interest to the general practitioner, as well as occasional articles that will interest the eye physician. The address of the Association is 535 North Dearborn Street, Chicago, Illinois.

The secretary of the Optical Society of OPTICAL SOCIETY America is Mr. L. B. Tuckerman, Bureau OF AMERICA:

of Standards, Washington, D. C. The "Journal of the Optical Society" does not carry any

1

Personal interview with Harold Kohn in his New York City office in Aug., 1934.

Association Inc. reported that in June, 1934, there were 7,000 paid-up members of that association. Judging from the enrollments of members of previous years, he estimated that there would be 8,000 paid-up members before the end of the year. He said that the association was made up of local, state, and national chapters. The nation headquarters are in Philadelphia, Pennsylvania.

This is an association with which doctors

AMERICAN MEDICAL ASSOCIATION
of Medicine officials. There are, in addition to general practitioners and

members who do some work with the eye, those who specialize in the eye or the ear, nose and throat. There

are no figures available that show separately the number of ocular members. An estimate made by Harold Kohn is

about 7,000 members. The American Medical Association

does not have statistics upon which to base an estimate.

The magazine of the American Medical Association, "Hygiene"

has articles that are of interest to the general practitioner,

as well as occasional articles that will interest

the eye physician. The address of the Association is 535

North Dearborn Street, Chicago, Illinois.

The secretary of the Optical Society of

OPTICAL SOCIETY OF AMERICA is Mr. E. F. Tschetter, Bureau of America:

of Standards, Washington, D. C. The

"Journal of the Optical Society" does not carry any

advertising. The American Institute of Physics Incorporated "An agency of cooperation in the interest of physics established by The American Physical Society, The Optical Society of America, The Acoustical Society of America, The Society of Rheology, and The American Association of Physics Teachers publishes a magazine called 'The Review of Scientific Instruments.'"¹

"The review carries articles on apparatus and instruments together with editorials, news and notes. It goes to every member of the five societies and has the largest circulation of any magazine in physics in the world."¹

It is a magazine that deals with the physical aspects of the optical industry.

This summer the Optical Manufacturers Code OPTICAL CODES: had been through its initial throes of organization and had established offices in the Times Building in New York City. Guy A. Henry, a man with a wealth of experience in the optical business was the Secretary-Director of the Code. The Retail and Wholesale Optical Codes have been organizing separately. Since the effect of the National Recovery Administration Codes can not be determined with certainty, and since the code authorities have requested that one postpone expressing an opinion, a mere mention of the fact that organization through such codes does exist will suffice at this

¹
From a letter written by M. S. Griffin of the American Institute of Physics Incorporated on July 27, 1934, and addressed to the writer.

time.

AMERICAN ASSOCIATION OF WHOLESALE OPTICIANS: This organiza-
tion was founded
in 1894 for
credit-reporting service and other trade association func-
tions.¹

MANUFACTURERS OPTICAL ASSOCIATION: The office of this or-
ganization is on 580
Fifth Avenue, New York
City. Mr. LaMotte Van Riper is the Director-Secretary; and
Mrs. H. S. Devault is the secretary to Mr. Van Riper. It
is a small and unpretentious office of an organization that
apparently sprung up to protect the interests of the small
optical manufacturers. They will exercise credit-rating
functions when they become more established; but it seemed
to the writer, on her visit to the office in the summer of
1934, that it would be a long time before this organization
became firmly established.

GUILD OF PRESCRIPTION OPTICIANS OF AMERICA, INC.: The headquarters of this or-
ganization are at 705 Bailey
Building, Philadelphia, Penn-
sylvania. Mr. J. B. Haines, 3rd is Director of Publicity.

"The first Guild of Prescription Opticians was or-
ganized on July 5, 1921, in Philadelphia by certain dis-
pensing opticians who realized that in union there was

¹
Adapted from a statement made by Guy A. Henry during a
personal interview in his office in Aug., 1934.

strength and that only through cooperation was it possible to educate the public to an understanding of their profession.

"The National Guild, organized in 1926, was founded upon the same principles as the parent organization.

"The Guild of Prescription Opticians has for its object the education of the public to the benefits of regular examinations by Eye Physicians who are graduates of a medical college, overcoming the indifference or disregard of the danger signals of eye trouble; the importance of having the prescription accurately filled and the glasses correctly fitted by a Guild Optician."¹

Montgomery-Frost Company, Inc., a Boston member of the Guild, said that Guild members had an agreement under which they agreed to maintain a minimum price, and a reasonable price for lenses and frames below which no member of the Guild will sell. It was not possible to get any further details about this price agreement.

¹ From a letter signed by J. B. Haines, 3rd, and addressed to the writer. Dated November 16, 1934.

CHAPTER IX

ADVERTISING

An oculist, since he is a medical practitioner

RETAIL: first, does not consider it entirely ethical to advertise. The optometrist, who sells glasses as well as examines eyes, will sometimes run a small advertisement in a newspaper. This is especially true in a small city that has its own local newspaper. One sees an occasional advertisement that announces the opening of a new shop. The optician, who sells lenses and frames, will also advertise in the newspapers occasionally, but the better-established optician will seldom seek publicity in this way.

The most frequent user of newspaper space--and it is by no means a regular or systematic campaign of advertising--is the optician or optometrist who is one of a chain of dispensers. Sometimes, it is a department store that has leased space to such a concern; and sometimes, it is a chain like the M. H. Harris Co. of New York; and sometimes, it is a chain of the Kresge variety.

The wholesaler, as we shall see in Chapter

WHOLESALE: X, is not entirely a distinctive unit of

the industry. When the wholesaler is directly affiliated with or controlled by the manufacturer, the manufacturer supplies the advertising. Perhaps the catalogue is to be considered as an integral part of the advertising expense of the wholesaler--and this would be particularly true where the wholesaler had the status of an independent jobber. The independent jobber, furthermore, since he does not benefit as directly as the controlled wholesaler from manufacturers' advertising, may advertise independently in the trade journals.

It is on the level of the manufacturer
MANUFACTURING: that most of the advertising is done.

The larger the manufacturer, the more advertising he can afford and uses as a rule. The manufacturer who controls well over 50% of the lens and frame business has only once hit the \$20,000 a year mark in its advertising budget. This was in 1926 and referred to advertising placed in popular publications like the "Saturday Evening Post" and other consumer-magazines. In "Leading Advertisers," a publication of the Advertising Department of the Curtis Publishing Company of Philadelphia, the 1934 figures for the year, 1933, do not even mention Optical advertisements. There is a heading¹ or classification for "Camera and Optical" but only the Kodak advertisements

¹ "Leading Advertisers"--The Curtis Publishing Company, Philadelphia: 1934.

for cameras show. It seems that optical advertisements are not among the leading ones.

What advertising there is done--with
 TRADE JOURNALS: any degree of regularity--is confined
 to the trade journals. It is done
 mostly by the manufacturers; and to a smaller extent by
 the independent wholesalers or jobbers. It is meant to
 reach the retail dispenser whether he be optician or
 optometrist. Chapter VII deals with these trade journals
 in a general way. Here we shall examine some of the ad-
 vertising aspects of these journals.

The rates, effective January 1, 1932,
"Optical Journal And Review Of Optometry": have not been changed. There is no
 agency commission and no cash discount.

Special positions are non-cancellable;
 and the minimum advertisement for such positions is one
 page. This refers particularly to the first and last
 inside pages and the pages facing first and last edi-
 torial pages and the center spread. For these special
 positions, prices are quoted only on application.

For general advertising, the rate is \$70.00 for
 one page for one time. There is a slight discount if
 the advertisement is to appear 6, 12, or 24 times; and

Data for this section was secured by correspondence
 with the trade journals, by information in the "Standard
 Rate and Data Service" for January, 1935, and by a per-
 sonal visit to the office of the "Optical Journal and
 Review of Optometry" in New York City.

a slight proportionate increase if less than one page is to be used for an insertion. For example, if the advertisement is to appear 24 times, the rate per insertion is \$50.00, instead of \$70.00. If only a quarter of a page is to be used, the rate for one insertion is \$20.00. Four quarters or a whole page at that rate would be \$80.00 instead of \$70.00.

Inserts per sheet of two pages are accepted, subject to mechanical restriction with regard to size and weight of the sheets, at the price of two pages.

Reading notices are not accepted. This is a form of free advertisement that it is only natural for the magazine to refuse.

There is a section for classified advertisements. It is used for small advertisements of various kinds, but mostly for help-wanted and situations-wanted advertisements. The situations-wanted classifications are offered a slightly better price than any other type of classified advertisement. There is a minimum charge of \$1.25 if ordinary type is to be used and \$2.50 if heavy type is specified. Answers to be forwarded require an additional charge of fifteen cents.

The "Optical Journal and Review of Optometry" is published semi-monthly and is issued on the first and fifteenth of the publication month. The last forms close at noon five days preceding the date of issue.

If proofs of the advertisement are desired, copy and plates must be in the publisher's hands one week preceding date of issue. When proofs are sent out of town, additional time must be allowed for transit--both for submitting proofs and for their return. Complete copy and plates for covers must be in the hands of the publishers ten days preceding the date of issue. Additional colors require two days extra time per extra color.

The measurements for a full page are: width, $5 \frac{3}{4}$ inches and depth, $8 \frac{1}{2}$ inches. The classified advertisement section is in three columns, each two inches wide.

Total circulation average for 6 months was 6,841 with a net, paid circulation average for 6 months of 5,971.¹

In the Standard Rate and Data Service for "Optometric Weekly" January, 1935, the rates for advertising in the "Optometric Weekly" are exactly the same as those for advertising in the "Optical Journal and Review of Optometry," namely \$70.00 per page per insertion with proportionate adjustments for 13, 27, and 52-time insertions and for insertions of less than a full page. There is no cash discount, but there is an agency commission of ten per cent.

There is no advertisement accepted for the front

¹ "Standard Rate and Data Service," January, 1935.

outside cover, and the other cover rates, as well as rates for color, are furnished upon request of the advertiser.

"All advertising copy is subject to the publisher's approval."¹ This probably refers to restrictions that may be made on copy that looks like a news item, and should be plainly marked "advertisement."

"Optometric Weekly" is published weekly on Thursday and issued the Wednesday preceding. The last forms close one week preceding the date of issue. A full page measures: width, 6 inches and depth, 8 1/2 inches.

"After three requests, the publisher has failed to furnish recent sworn circulation statement in accordance with Standard Rate and Data Service requirements."¹ In a letter to a prospective advertiser, dated July 26, 1934, The Professional Press, Inc., publishers of "Optometric Weekly," made the following statement: "Circulation figures are constantly changing. The last figures to come through from our circulation department a few weeks ago gave the circulation at approximately 8,300. The Weekly is circulated in the entire United States, Canada and many foreign countries."

Optical World Publishing Co.,
"Western Optical World": Box 210 Arcade Station, Los Angeles, California, are the publishers of "Western Optical World." Rates, effective

¹Standard Rate and Data Service," January, 1935.

January 1, 1922,¹ were lower than those in the two previously mentioned publications. The price per page per insertion is \$50.00, with an allowance of \$5.00 per page per insertion if the advertisement is carried twelve times.

No advertising is accepted for the front outside cover, and the inside covers are \$75.00 per page per insertion. The outside back cover is \$100.00 per page per insertion. Special positions and preferred positions are an extra ten per cent.

There is an agency commission of fifteen per cent; and the cash discount is two per cent ten days from date of invoice.

"Western Optical World" is published monthly, with forms closing the fifteenth of the preceding month. Circulation figures were refused on three requests of the "Standard Rate and Data Service."¹

The manufacturer advertises his product for
 DISPLAYS; his own benefit primarily. But in those
 POSTERS;
 CATALOGUES: instances where the manufacturer does not
 control any retail or wholesale-retail
 outlet, he must bring his product before the consumer
 so that a retail demand will be created and the manufacturer will be ultimately benefited.

¹
 "Standard Rate and Data Service," January, 1935.

The lay public does not contribute, as a rule, to trade publications, and therefore some other means of presenting his message must be used by the manufacturer. The most common method is the poster which is displayed in the shop of the optician or the optometrist. Some of the best-looking posters that I have seen are colored reproductions of portraits of human models. The artist, Bradshaw Krandall, has painted a particularly striking portrait of a young woman who is wearing the Bausch & Lomb "Ful-Vue" glasses. It is a portrait of a regal, aristocratic young woman in full evening dress. Her rimless glasses, with the "Ful-Vue" mountings are in complete harmony with her dress and her features.

Displays are frequently adapted from these portraits--displays on cardboard with an arrangement which permits them to be used upright on the display counter or as part of the window-trim.

Some of the manufacturers are only too glad to furnish these displays and sales helps to the wholesalers and the retailers. Others, although they will not sell the displays, insist that the dealer buy a certain quantity of merchandise before they will furnish him with sales helps.

Catalogues, which are issued by the manufacturing and wholesale establishments, may be secured upon the request of some reputable and established retail

distributor. It is almost impossible for any lay person to secure such a catalogue and price list unless such a person has access to one through some retail distributor. These catalogues are paper covered and vary in size with the size of the manufacturer. They have adequate cuts, but are only in the black and white without any color, except possibly on the cover design.

Speaking of the advertising that the retail
 ADVERTISING dispenser might do for himself, we find the
 CONTENT: following advice in "The Business Side of
 Optics"¹:

"Advertising is a purely local question. General publicity advertising is no good--it must show up on your books. I have found less than one per cent of return in bill boards, programs of all kinds, signs tacked on fences, advertising in and around hotel offices on registers, blotters and such things. I have never had an advertising novelty of any description which has paid me at all. The two kinds of advertising that pay are: (1) Straight newspaper advertising, and (2) circular letters or booklets. And my own experience has brought me sixty per cent more returns from newspaper advertising than from circulars. I now find that the most effective is the educational advertising that is educating the public to something better and more scientific as Kryptok

¹
 Washington, D. C. (Roe Fulkerson) "The Business Side of Optics" --Topaz and Kaemerle, Publishers. Chicago, 1913.

lenses instead of cements. It pays. Straight copy, no illustrations--because they are, in the opinion of the author, either 'cute' and not serious enough or uninteresting and distract interest--is preferable.

"Letters make good follow-up for newspaper advertising, but do not take its place. They should be short and carry first-class postage. The letter must be a good job--first you must get it read. Persistency is important--keep at your scheme of advertising and keep a record of your results in advertising."

Now Roe Fulkerson wrote this little book with only the practical experience of twenty years as an optician in Philadelphia as his knowledge. He wrote a little, informal book that told in an informal manner of his experiences. It was written before the World War and before this "business depression." But it contained homely truths that are still true today.

The Better Vision Institute, perhaps the outstanding authority of good retail optical advertising, not only advocates advertising that educates the public to "something better and more scientific," but furnishes to its members copy for such advertising and sponsors radio broadcasts. Most of the advertisements that I have seen, whether they be newspaper or magazine advertisements, have some sort of illustration. These illustrations are frequently a pair of glasses of the

type that the advertisement mentions; and quite as frequently (in retail-to-consumer rather than manufacturer-to-retailer advertising) are a picture of some model wearing glasses or some model taking part in an activity in which wearing glasses would be of some aid.

The advertising of prices of lenses is frowned upon by the Retail Optical Code, and by the more ethical retail dispensers. Since there is such a wide variation in the qualities and in the strengths and prices of lenses, any advertising that quotes prices for lenses is apt to be very misleading. In store windows, one will frequently see displays with the prices attached to the samples of spectacles--there is usually a little sign which reads: "These prices refer to the frames only."

CHAPTER X

DISTRIBUTION SET-UP

In each industry the facilities for investing raw materials with ultimate consumer values differ in detail, but in general follow the rough divisions of: manufacturing, wholesaling, and retailing. There are a few industries, such as the boot-and-shoe industry, where a few of the manufacturers will advertise a "direct-from-the-factory-to-consumer service," purported to save the operating expenses and profits of the middleman or the wholesaler. One may express this service in another way by saying that the manufacturer maintains one or more retail outlets.

In Figure 24, we have the sixteenth-century coat of arms of the Spectacle Makers' Guild and an old peddler¹ of spectacles. One may also see a picture of the old optical shops where spectacles are displayed and sold like jewelry. The patient picks out the one that pleases him most--there is no refraction and no fitting, and probably no correction of defect. We like to think that we have progressed far beyond those primitive, early days. In the manufacturing and marketing of eyeglass

¹"Hygeia" --April, 1931. Page 349.

frames, the early history, however, has a tendency to persist.

A resume of the present-day manufacturing and dispensing arrangements will make self-evident the services and abuses of our present system:

There is manufacturing going on in almost
 MANUFACTURING: all of the branches of the industry. The
 large wholesale shop will have equipment
 to complete several of the finishing processes in the
 manufacture of the lenses; and the retail optician's
 shop will have equipment to do other finishing processes.
 Even the smallest shop will have tools to adjust and bend
 and fit the finished frame to the individual requirements
 of the wearer. Because of this overlapping of function,
 it is very hard to classify the establishments of the in-
 dustry by manufacturers, wholesalers, and retailers. That
 even persons in key positions have difficulty in making
 such a classification is illustrated by the fact that Mr.
 Guy A. Henry, Director-Secretary of the Optical Manu-
 facturers' Code, and an executive in the trade organiza-
 tion of the optical wholesalers, says¹ that there are 118
 optician manufacturers.

The President of Better Vision Institute, Mr. M. J.
 Julian, says that in 1933, by actual count, there were¹
 76 manufacturing concerns.

¹
 In a personal interview granted the writer in Aug., 1934.

Mr. Roy D. Martin, in behalf of the "Code Committee,"¹ made the statement that there were "about 75 manufacturers."

The volume of business (running from a high point of \$23,000,000 annually to a low point of \$12,000,000 in 1932, and averaging about \$22,000,000 a year) is by no means² equally divided among these manufacturers.

Three manufacturers do seventy-five per cent of the business; while twenty-four manufacturers do ninety-four per cent of the business.²

On the whole, the turnover is not great when we consider the average volume of business (\$22,000,000) in comparison with the invested capital:²

Table 1

ANNUAL VOLUME OF MANUFACTURING

<u>Year</u>	<u>Approximate Investment</u>
1928	\$29,000,000
1929	31,500,000
1930	30,500,000
1931	30,000,000
1932	28,000,000
1933	28,000,000

¹ Stenographic Report on "Hearing on Code of Fair Practice and Competition" presented by Optical Wholesale Industry, December 3, 1933.

² This information is the result of a survey of the Better Vision Institute. The figures have never been published but are in the private files of the Institute. They were made available to the writer during a personal interview with the President, Mr. M. J. Julian, in Aug., 1934.

These figures are compiled from the report of the previously mentioned twenty-four manufacturers who do ninety-four per cent of the business.

The enforcement of the Manufacturers' Optical Code necessitated the employment of about 20% more employees on the manufacturing level, and the dollar payroll rose about 20%.¹ There was not, however, so great a disparity between the hours of labor prescribed by the code and those that were average weekly hours of employment for about five years before the enforcement of the code.

(See Table 2.)

Table 2

AVERAGE HOURS OF EMPLOYMENT PER WEEK		2
Year	Average Weekly Hours	
1928	46.8	
1929	44.8	
1930	45.2	
1931	44.7	
1932	39.0	
1933	40.6	

¹ This information is the result of a survey of the Better Vision Institute. The figures have never been published but are in the private files of the Institute. They were made available to the writer during a personal interview with the President, Mr. M. J. Julian, in Aug., 1934.

² These are figures given the writer by Mr. M. J. Julian. The Code was approved on October 9, 1933 by President Roosevelt. The provision in the Code relative to hours of labor is, in part, as follows: "On and after the effective date, the maximum hours of labor for employees shall be forty (40) hours per week."

"Manufacturers sell principally to wholesalers" according to a statement of the United States Department of Commerce, Bureau of the Census. A release on February 10, 1931, showing the distribution of the 1929 sales of the optical goods industry, gave the following figures, compiled under the direction of Edward R. Dewey, Chief of the Industrial Marketing Section: Sales to wholesaler, 66.3%; interplant transfers and sales to industrial and other large consumers, 22.0%; sales to retailers, 10.9%; sales to home consumer, 0.8%.

There are at least two, and possibly more, WHOLESALE: kinds of wholesalers in the industry. The most common type, perhaps, is that which is controlled by the manufacturer. In some cases, the factory advertises branches in various sections of the country. The American Optical Company has offices in the key centers of the United States as well as in foreign countries. In other cases, the wholesaler, who may or may not have been a separate entity from the manufacturer at one time, has gradually come under the control of one of the large manufacturers. In this way, Bausch & Lomb Co. also has the controlling

1
According to "The Southbridge, Mass. News," Vol. XI, No. 7, 1933, in 1923 the American Optical Company purchased businesses of twenty-three leading wholesalers in the United States, and now has over two hundred wholesale offices available. The central offices of the American Optical Company are in Southbridge, Massachusetts. They have divided the country into several zones operating from the following offices: Boston; Atlanta, Georgia; Chicago; Memphis, Tennessee; Dallas, Texas; Kansas City; San Francisco.

corporate interest, if not direct ownership, of wholesale houses such as Colonial Optical Company of Boston. These manufacturer-controlled wholesale houses have, as a rule, an understanding and an amicable relationship with similar houses controlled by competitive manufacturers--to the extent that they can procure merchandise for the retailer who insists on the product of the competitor.

When new or radical improvements are made in some lens or frame, and a patent is granted, a competitor has recourse to one of the following procedures: (1) he may buy from the firm who owns the patent their products; (2) he may make a special agreement whereby he manufactures his own product and pays royalty to the owners of the patent for each piece of merchandise on which he uses the new device or improved technique; (3) he may continue to feature his own product without the improvement and stand the chance of losing orders.

The second type of wholesaler is known as the "independent wholesaler" or jobber. He buys from whatever sources he can, and sells wherever he pleases. He may stock the lines of several manufacturers, and may feature many qualities of merchandise.

Depending upon the ethics of the firms and the protection they offer to their retail trade, these wholesale houses (both independent and manufacturer-controlled) will

sell direct to the consumer who comes in with a prescription from some physician. In some sections of the country (particularly in the western states) this practice is more common than in others; and this fact is indicated in Chapter V on "Trade Practices."

Mr. Guy A. Henry estimates that there are 249 recognized optical wholesalers who operate in addition some 335 branches; and that there are also approximately 160 semi-wholesalers who do a half-in-half retail and wholesale business. Mr. Roy D. Martin, in behalf of the Code Committee, (Hearing on Code of Fair Practices and Competition Presented by Optical Wholesale Industry, December 3, 1933) says that there are 200 recognized firms operating between 500 and 525 established wholesale and prescription outlets; and, furthermore, that a large wholesale office will stock 25,000 to 30,000 items, and an ordinary branch office will have no less than 3,000 to 4,000 items.

The annual volume of wholesaler-to-retailer business is approximately \$40,000,000. This includes ophthalmic¹ equipment for examination. The annual normal retail income from the same sources is approximately \$135,000,000. It is not reasonable, however, to conclude from these two figures any relationship that would point to mark-up or profit because of the wealth of information concerning operating expenses and overhead that is not available at

1

From private files of Better Vision Institute.

this time.

We have already seen that retailing (selling RETAILING: to the ultimate consumer or wearer) is to a very limited extent a function of the manufacturer, and to a greater extent a partial function of the semi-wholesaler. The optician, optometrist, and chain store and department store are, however, the more important retail outlets.

The optician is not qualified to examine eyes and prescribe glasses, but he has the technical knowledge to interpret and fill prescriptions for glasses; and the mechanical ability to adjust the frames correctly for the comfort of the patient. The optician is a modern development from the old spectacle shop. Until about two decades ago he was still allowed to go on selling glasses to any one who might pick them out, but now, in all of the states of the United States and the Provinces of Canada, it is illegal to sell corrective glasses without a prescription.

So far as the author has been able to determine, there is no authoritative count of the number of opticians in the United States. In the first place, many of the opticians are merely one of the departments in some jewelry store. In the second place, the opticians are far more common in the eastern part of the United States than they are in the western. In the

third place, the functions of the optician vary. Some of the departments or shops are merely "blinds" in charge of a man who knows only how to sell glasses as he would sell automobiles or gloves. If there is a prescription to be filled, he tells the patient to come back in a few days; and in the meantime he has a prescription-filling wholesaler make up the glasses. He may, in time, acquire the knack of tightening a screw and slightly bending a temple. He has neither the equipment, the knowledge, nor the ability to tell a fine lens from a poor one or to finish and mount a lens.

At the other extreme, we have the reputable optician who has an excellent technical and mechanical background, adequate equipment for the necessary finishing processes, and an ethical standard of fair dealings with their clientele.

The optometrist is a man qualified to examine the eye and detect and prescribe correction for defects. The optometrist usually has, also, the training that an optician has; and he can and does sell and fit spectacles. It formerly was very common practice to advertise a free examination, or to advertise an examination and glasses, both costing some specified price. This is now frowned upon by both the Retail Optical Code and by most of the reputable practicing optometrists. The qualifications for optometrists vary with the state laws, and will be

discussed in more detail in Chapter XII.

Although the figures quoted for the number of optometrists in the United States vary from about 14,000 to 22,000, the concensus of opinion seems to indicate that 16,000, which, the American Optometric Association claims, represents the number of optometrists in the United States eligible for membership, is the most nearly correct estimate. In the 22,000 registered optometrists, there are a great many duplicates. If a man is registered to practice in more than one state he is counted in each state, while instead of there being two or three optometrists, there is really only one.

Since there are many optometrists who work for others, the low estimate of 14,000 probably refers to the number of optometric establishments, which is 14,000.¹

The chain stores are combined buying enterprises or multiple-outlet enterprises or chain group stores. Out of the approximately \$135,000,000² annual retail sales, these chain stores do about six and two-thirds per cent of the volume. Frequently, the optical department of one of our large department stores is only a link in one of these chain enterprises. The space is leased from the department store, and the lessee installs the furnishings, and hires, for a small weekly wage, a young and

¹ Mr. M. J. Julian, President of the Better Vision Institute.

² Approximate annual retail sales of the optical industry.

inexperienced graduate of a school of optometry. Furthermore, the time which he can spend on the examination of a patient is limited. He is given an allowance of something like ten minutes to examine the patient. It makes no difference if the case is difficult and requires special attention--the patients must not consume too much time, or the enterprise ceases to be profitable to the backer. It is these optometrists who do most of the advertising that is found in our newspapers. To them, and their employers, glasses are merchandise to be sold as quickly and profitably as possible and with as little a gesture as possible to comply with the law of the state pertaining to compulsory examination by a registered optometrist.¹

It is by no means uncommon to find that these leased departments use the charge accounts of the department store. That is one of the privileges that they lease along with the space. The customer has no way of knowing that the optometrist is a separate company from that of the department store until he has an occasion to make some sort of complaint or adjustment. If he goes to the regular Adjustment Department of the department store, he is sent down to settle the matter with the optometrist--² and in any way that the optometrist sees fit.

¹ A local physician has given the writer permission to use his name if proof of this condition should be necessary.

² An employee in a leased department of a department store furnished the information for this paragraph.

Optometrists who are struggling for the maintenance and raising of their professional standards feel very strongly opposed to this type of corporate practice. In any trade journal or other vehicle of expression, in every convention of optometrists, there is sure to be a tirade against commercialism in optometry; there is sure to be some exhortation to better education and higher ideals in the ranks of optometrists. We of the laity can only hope that the professionalism will prevail over the cold-blooded commercialism that often exploits the ignorant layman.

The extension of credit along retail lines, especially installment buying, excited a great deal of comment in 1926-27, when a report was made by the United States Bureau of Foreign and Domestic Commerce. There were returns for 86 optical goods stores covering the years 1925-1927. Of course, optical goods stores do not cover the field for eyeglass frames and lenses since, in the first place, these stores also sell items like microscopes and opera glasses; and in the second place, many retail outlets for eyeglass frames and lenses, such as jewelry stores are not included. The investigation showed, however, that 24 stores sold for cash only; 57 sold for cash and open credit only; and 5 sold for cash and installment credit. In terms of percentage, that was translated: 59.9% for cash;

33.8% for cash and open credit; and 1.7% for installment credit.¹ In Chapter XI, there will be some comparison made of the prices charged by installment-credit stores and prices charged by cash stores. It will be comforting to realize that there is only a very small percentage of installment stores to cope with if the figures of the 1927 investigation may be taken as being indicative of credit conditions today.

¹ "Optical Journal and Review of Optometry," November 7, 1930, pages 21-23.

CHAPTER XI

ESTIMATED MARK-UP

No industry is delighted to give to the
INTRODUCTION: public a basis for finding out what profit
that industry makes on its merchandise;
far less is the industry which manufactures and distrib-
utes eyeglass frames and lenses pleased with an investi-
gation into the intimate realms of mark-ups and profits.
In an interview with Mr. M. J. Julian, President of the
Better Vision Institute, the writer was given permission
to use the following figures as an estimated mark-up:
Let us suppose that an article cost the retailer \$1.00.
The actual manufacturing cost was probably about forty
cents; the price that the wholesaler paid for it, about
sixty-six cents. When the retailer, however, sells it
to the consumer-customer--the price is approximately
\$5.00.

It is not surprising that the cost of a lens will
not be greatly marked up in the transaction between the
manufacturer and the wholesaler. It has been pointed
out that, in the majority of instances, the wholesale
house is only a branch or another department of the
manufacturing concern. The price of the wholesaler

to the retailer is kept down to a normal profit, perhaps, by competition. Although some wholesalers have a greater variety to offer to the retailer, they all can offer items that are about similar in mechanical efficacy. If they find that there is some item that they can not offer because another concern has the exclusive patent for manufacture, they will either try to switch the sale to an item that "is practically as good" or they will enter into some sort of a reciprocal trade agreement that will permit competition.

The price that stands out is the result of the tremendous mark-up in which the retailer indulges. Mr. Guy A. Henry, Director-Secretary of the N. R. A. Optical Manufacturers' Code says that any mark-up is justified in view of the fact that the retailer is not simply selling merchandise, but he is selling service. That is the answer that the optician or other retail dispenser will give you if you face him with the actual facts.

Perhaps that is a justification. The reader is the best judge of his reaction. Let us take the case of a retailer who does not have his own finishing shop. He sends to the wholesaler the prescription and the measurements for the glasses. The wholesaler fills out the prescription and assembles the completed glasses. The retailer has spent in his "service": time to help the patient decide about the style of the glasses, a very

few minutes in taking the measurements, and perhaps five minutes in adjusting a temple or bending a nose-piece. The sales time is only that which would be spent in selling any item of apparel. The "service" time resolves itself into an initial additional outlay of some ten minutes with a possible outlay of a few minutes more should the patient come back for some further adjustment, or minor repair for which he may not be charged.

Now the price of glasses does not run, by any means, in the neighborhood of \$5.00. That is rather to be considered distinctly as a minimum price. Considering the arbitrary price of \$5.00 or a more common price of \$10.00 to \$12.00, the reader has the privilege of figuring how much an hour the time of the retailer is worth; and the privilege of judging whether or not the mark-up is justified from the point of view of "service."

In the writer's opinion, Mr. Julian is a man who is in a position to know the true situation in the marketing of eyeglass frames and lenses; he is in a position to give a conservative and unbiased opinion that one may consider authoritative. In order, however, to check up in a concrete way the accuracy of Mr. Julian's estimate, the writer approached several retailers and asked them for their mark-up figures. Such information was refused point-blank in some instances. In one case, the writer was referred to the Guild of Prescription

Opticians of America, Inc. It was intimated that the Guild members had agreed not to sell lenses below a certain price and that the Guild would have information as to what that price was. The Guild denied having any such information.

PERSONAL INVESTIGATION: Since, therefore, it seemed unlikely that any corroborating evidence could be obtained by a direct approach to the retailers, the writer hired an investigator who made personal calls on representative retail establishments. The investigator was furnished with a bona fide prescription issued by a reputable hospital clinic. He was instructed to say that it was the prescription of a relative who wanted an estimate on frames and lenses before buying her glasses.

It is not the purpose of this paper to make any comparisons that will result in conclusions injurious to the trade of any particular retail establishment. Therefore, identifying references will be omitted and only the general findings will be cited:

The prescription called for a pair of glasses that could be filled either with single vision glasses or with double vision, bifocal glasses, depending on whether or not the patient wanted glasses only for distance or glasses that she could use for street wear and for reading also. The wholesale price for the pair of lenses

(the price that the retailer would have to pay for the lenses completely mounted and ready to hand over to the patient) would vary, of course, with the quality of the glass, and with the terms that the retailer had been given by his wholesale connection. The retailer who had his own shop and could save some of the finishing costs might add to his profit legitimately. The point that the writer would, however, like to make is that the absolutely maximum price that could be paid, for the very best quality lens of the strength required in the prescription, with no quantity discount allowed from the wholesale list price--that maximum price was \$1.70 for a pair of lenses.

Some of the concerns that the investigator visited refused to give the estimate for the lenses and the frame separately; some of them refused to give any information, claiming that they would deal with the patient directly when she was able to come in herself.

From those concerns reporting the price of the pair of prescribed lenses, the following information was elicited:

<u>Concern</u>	<u>Price</u>
Type #1, Independent Optician-----	\$3.35
Type #2, Guild Optician-----	6.00
Type #3, Guild Optician----- offering 10% discount on hospital prescriptions.	6.00
Type #4, Department Store, Leased Concession----	6.00
Type #5, Department Store, Leased Concession----	13.25
Type #6, Credit Store (frames and lenses ----- complete)	19.50

In comparing these prices with the estimates of Mr. Julian, the reader should bear in mind that the prices were quoted to the representative (apparently) of a patient who had very little money, and could barely afford an examination in a clinic where a nominal fee of some fifty or seventy-five cents was charged for the examination and prescription. These would by no means be the average prices or the maximum prices if more than one quality of lens were quoted on. By that, the writer does not mean to imply that a price was quoted on a lens that was physically imperfect (although there are firms that are selling those to the public today under false pretenses) but rather that the price was quoted on a plain lens and that nothing extra was added for edging or fancy shaping or for a tinted lens.

The prices on the bifocals or double vision lenses were approximately in the same range. The wholesale cost for the prescription lens was approximately double that of the single vision lens, and the retail mark-up was proportionate.

It was not possible to compare satisfactorily the prices on the frames since the specifications given by the firms to the investigator were not comparable. It might, however, be of interest to compare the price quoted by the various concerns for the completed glasses--with the most inexpensive frames and single vision lenses

specified and requested by the investigator:

<u>Concern</u>	<u>Price for Complete Eyeglasses</u>
Type #1-----	\$ 4.35
Type #2-----	11.00
Type #3-----	18.00
Type #4-----	17.75
Type #5-----	26.75
Type #6-----	19.50

The price of \$1.70, which the retailer paid for the pair of lenses, is maximum. The reader should bear in mind--before he makes his final decision as to the comparison between the actual mark-ups found in the investigation and the estimate of Mr. Julian and as to the justification of so great a retail mark-up--that lenses of the identical strength that the prescription called for, and guaranteed first quality, can be purchased for sixty (60¢) a pair in lots of ten pair! If the retailer cares to buy the same lenses through an American jobber who imports from Germany, the price is forty cents (40¢) a pair!

¹
Wholesale price lists are not readily available to the layman. It was the wish of the dealer who procured for the writer the wholesale price lists that she refrain from mentioning specifically the source of information.

CHAPTER XII

LEGAL AND EDUCATIONAL OPTOMETRIC REQUIREMENTS

In the summer of 1934, the writer spoke to
INTRODUCTION: Mr. Harold Kohn, the attorney for the American Optometric Association, and inquired if any compilation or study had been made of the United States' laws concerning the practice of optometry and the sale of eyeglass frames and lenses. Mr. Kohn regarded the writer with a gleam of interest in his eyes and said in effect: "No, I have never seen such a study or compilation. The only way that it could be done would be to go through the state laws, and if you have ever done any legal work you know what a tremendous task that is. For years, I have been considering doing such a piece of work in my spare time. I never seem, however, to get enough spare time, and I can never get any one to pay me to do the work in my working time. If you ever do such a study, or if you ever see one, I should very much appreciate your letting me see a copy."

A few months later, the writer spoke to Dr. Theodore F. Klein of the Massachusetts School of Optometry, and was informed that there were about nine Grade A schools of optometry in the United States, but that he could not

for the moment name them all.

It is rather out of the scope of this paper to go into detail concerning legal and educational requirements and restrictions for the practice of optometry. Since, however, the optometrist is frequently one of the retail distributors of eyeglasses, a brief consideration of his status is justified.

Before the turn of the twentieth century, the practice of optometry was not regulated, and many opticians and unqualified merchants were selling spectacles to the public without even a semblance of an examination to see what the patient needed. It was a case of self-examination--the patient prescribing for himself, and being considered a customer rather than a patient or client.

"As each state adopted its code of laws defining optometry, regulating its practice and providing standards for the education and licensure of optometrists, all persons who were then engaged in the occupation of fitting spectacles to human eyes, regardless of the adequacy or inadequacy of their previous education, were held to be practicing optometry within the meaning of the law, and were exempted from all or part of its provisions and requirements. They were granted licenses usually without state board examination, upon payment of the required fees, and they have since been termed 'exempts' in

contradistinction to the graduates of approved schools of optometry who have obtained licenses to practice by passing state board examinations.

"A good many of these 'exempts' were exceptionally able and well trained. Many of them were graduates of optometric schools at the time of their registration; others have taken educational courses since registration to qualify themselves for scientific practice. Thus, the term 'exempt' is not necessarily one of reproach, although it is a fact that numbers of the men in that category have done nothing since their original registration to improve their knowledge or increase their ability as optometrists, and are incapable today of discovering, much less identifying, ocular disease.....or, in short, functioning as eye men at all except by trial-and-error methods of the test chart and the trial case." ¹ Table 3 shows the year of passage of each of the state optometry laws. ¹ The laws, as we shall see presently, vary in their requirements, but it took twenty-three years for some regulation to be put into effect. Now all of the states of the United States as well as all of the Provinces of Canada have some regulation governing the practice of optometry.

Apparently, the date of the passage of the optometry

¹ Needles, William B. "A Survey of Optometry" --published by the Northern Illinois College of Optometry, Chicago, 1934.

Table 3

STATE OPTOMETRY LAWS

<u>Year</u>	<u>States Passing Law:</u>
1901	Minnesota
1903	California, North Dakota
1905	New Mexico, Oregon
1907	Arizona, Idaho, Indiana, Montana, Nebraska, Tennessee, Utah
1908	New York
1909	Delaware, Florida, Iowa, Kansas, Maine, Michigan, North Carolina, Rhode Island, Vermont, Washington, West Virginia.
1911	New Hampshire, Oklahoma
1912	Massachusetts
1913	Colorado, Connecticut, Nevada, South Dakota
1914	Maryland, New Jersey
1915	Arkansas, Wisconsin
1916	Georgia, Virginia
1917	Pennsylvania, South Carolina, Wyoming
1918	Louisiana
1919	Alabama, Illinois, Ohio
1920	Kentucky, Mississippi
1921	Missouri, Texas
1924	District of Columbia

law has nothing to do with the stringency of the requirements. In Table 4, which shows the educational requirements of the 48 states,¹ we see that New York, with the most rigid legal requirements, passed the law in 1905; while Kentucky which is perhaps at the lenient extreme of the scale passed its law in 1920. North Dakota, one of the first to pass a law, is in agreement with the educational requirements of the average.

Eight of the states require only two years of high-school training as a foundation for the optometry training which may consist of a requisite number of years either in an optometric college or in the position of an apprentice. The other states, except Kentucky, have a four-year high school requirement. The requirements for attendance in a college of optometry vary from no attendance requirements--only a prescribed amount of apprenticeship--to a four-year course with a degree of A. B. or B. Sc. Twenty-three of the states require two years at a college of optometry; five require three years. Ten of the states require 2000 hours, which amounts to about two and one-half years of college of optometry work. In Northern Illinois College of Optometry, the three-year course totals 3,097 hours of instruction. For graduation, however, the student must get passing grades in

1

"The Optical Journal and Review of Optometry," June 15, 1933, pages 100-101 and 136.

EDUCATIONAL REQUIREMENTS FOR THE PRACTICE
OF OPTOMETRY IN THE 48 STATES

State	High School	Optometry College	Appren- ticeship
Alabama (1)	2 yrs.	2 yrs.	3 yrs.
Arizona	4 yrs.	Acc.*	-----
Arkansas (1)	2 yrs.	2 yrs.	2 yrs.
California (2)	4 yrs.	2000 hrs.	-----
Colorado	4 yrs.	2000 hrs.	-----
Connecticut	4 yrs.	3 yrs.	-----
Delaware	4 yrs.	3 yrs.	-----
Florida	4 yrs.	2 yrs.	-----
Georgia	2 yrs.	2 yrs.	-----
Idaho	2 yrs.	2000 hrs.	-----
Illinois (1)	4 yrs.	2000 hrs.	2 yrs.
Indiana	4 yrs.	2000 hrs.	-----
Iowa	4 yrs.	2 yrs.	-----
Kansas	4 yrs.	2000 hrs.	-----
Kentucky (3)	-----	Acc.	-----
Louisiana	4 yrs.	3 yrs.	-----
Maine (1)	4 yrs.	4 yrs.	3 yrs.
Maryland	4 yrs.	2 yrs.	-----
Massachusetts	4 yrs.	2 yrs.	-----
Michigan	4 yrs.	2 yrs.	-----
Minnesota	4 yrs.	2 yrs.	-----
Mississippi	4 yrs.	2 yrs.	-----
Missouri (1)	2 yrs.	1000 hrs.	3 yrs.
Montana	4 yrs.	2 yrs.	-----
Nebraska	4 yrs.	2 yrs.	-----
Nevada	4 yrs.	2 yrs.	-----
New Hampshire	4 yrs.	2 yrs.	6 mos.
New Jersey	4 yrs.	3 yrs.	-----
New Mexico	4 yrs.	2000 hrs.	-----
New York (4)	4 yrs.	4 yrs.	-----
North Carolina	4 yrs.	2 yrs.	-----
North Dakota	4 yrs.	2 yrs.	-----
Ohio	4 yrs.	2 yrs.	-----
Oklahoma (1)	4 yrs.	Acc.	2 yrs.
Oregon	4 yrs.	2 yrs.	-----
Pennsylvania	4 yrs.	3 yrs.	-----
Rhode Island (1)	2 yrs.	12 mos.	3 yrs.
South Carolina	4 yrs.	2000 hrs.	-----
South Dakota	4 yrs.	2 yrs.	-----
Tennessee	4 yrs.	2 yrs.	-----
Texas (1)	4 yrs.	2 yrs.	2 yrs.
Utah	4 yrs.	2000 hrs.	-----
Vermont	2 yrs.	2 yrs.	-----
Virginia (3)	4 yrs.	Acc.	-----
Washington (1)	2 yrs.	Acc.	3 yrs.
West Virginia	4 yrs.	2000 hrs.	-----
Wisconsin (1)	4 yrs.	2 yrs.	2 yrs.
Wyoming (1)	2 yrs.	Acc.	3 yrs.

LEGAL EXAMINATION AND REGISTRATION FEES FOR
THE PRACTICE OF OPTOMETRY IN THE 48 STATES

State	Examination Fee	License Fee	Annual Renewal Fee
Alabama	\$25	---(1)	\$ 3
Arizona	25	\$ 5	3
Arkansas	15	10	2
California	20	5	10
Colorado	25	---	5
Connecticut	15	5	5
Delaware	25	10	2
Florida	15	25	5
Georgia	10	10	3
Idaho	25	1	2
Illinois	10	5	1
Indiana	10	5	8
Iowa	20	None(2)	1
Kansas	20	5	5
Kentucky	25 max.	---	10 max.(3)
Louisiana	25	---	2
Maine	5	10	5
Maryland	20	5	5
Massachusetts	25	None	2
Michigan	25	10	8
Minnesota	20	5	5
Mississippi	25	---	2
Missouri	10	15	5
Montana	25	10	10 max.
Nebraska	20	---	1
Nevada	25	5	5
New Hampshire	20	---	2
New Jersey	15	10	5
New Mexico	20	5	5
New York	15	10	2
North Carolina	20	5	5
North Dakota	20	5	5
Ohio	25	---	5
Oklahoma	25	---	5
Oregon	25	5	5
Pennsylvania	25	---	5
Rhode Island	10	10	5
South Carolina	10	5	20 max.
South Dakota	20	5	5
Tennessee	25	---	6 max.
Texas	15	5	5
Utah	20	5	2.50
Vermont	15	10	3
Virginia	25	---	5
Washington	15	10	2
West Virginia	20	5	10
Wisconsin	10	---	2
Wyoming	25	5	2

FOOTNOTES

Table 4

(1) In Alabama, Arkansas, Illinois, Maine, Missouri, Oklahoma, Rhode Island, Texas, Washington, Wisconsin and Wyoming, candidates who have studied for a prescribed period in the office of a practicing optometrist, are eligible for admission to examination.

(2) California accredits only such universities as give a standard course in optometry leading to a bachelor degree, and also optometry schools that give a course of 2000 hours.

(3) In Kentucky, Virginia and several other states, one fee covers both examination and registration.

(4) To meet the professional educational requirement in New York, candidates must be graduates of a school of optometry conducted as a department of a university, with the degree of A. B. or B. Sc.

* Accredited. Candidates in those respective states must have graduated from an optometry school or college accredited by the Board of Optometry Examiners in that particular state.

Table 5

(1) The license fee is evidently included in the fee for examination.

(2) No license fee is charged as is stated in the optometry law.

(3) Maximum. The amount of renewal fee in each case is variable and is fixed from year to year by the State Optometry Board, depending on its budget requirements for the year.

only 85% of his work or 2,632 hours of instruction.¹

For the examination fee, the rate ranges from \$25
FEES: to \$5. License fees run from nothing up to \$25.

Annual renewal fees run from \$1 to \$20. By comparing Tables 4 and 5, one may see that it does not follow by any means that the states with the lowest educational requirements have the lowest examination or license fees.²

Reciprocity is the privilege of practicing
RECIPROCITY: optometry therein granted by one state to
the registered optometrist of another state.

"Reciprocity is granted by the following States to other States that have equal educational standards and similar requirements, provided that the reciprocal relations are mutual: Alabama, Illinois, Indiana, Kansas, Kentucky, Maine, New Hampshire, New Jersey, Ohio, Oregon and Tennessee.

"The following States grant reciprocity to applicants who have been licensed by examination in States that extend reciprocity: Iowa, Maryland, Massachusetts, Michigan, Missouri, Nevada, Oklahoma, and Virginia.

"The following States have reciprocity with other States on a mutual basis, but require applicants to pass

1

Catalogue for 1934-35 of Northern Illinois College of Optometry.

2

Tables 4 and 5 are adapted from information on pages 100 and 101 in the June 15, 1933, issue of "The Optical Journal and Review of Optometry."

a practical examination before granting them a reciprocity certificate: Minnesota, North Dakota, Texas and Wisconsin.

"Reciprocity is granted in the following States but it remains optional with the Optometry Board or Department of Registration, each case being considered on its merits: Montana, North Carolina, South Dakota and Utah.

"The following States grant reciprocity in the discretion of their respective boards: Arkansas, Georgia, Connecticut, Mississippi, Nebraska, South Carolina and Vermont. Arkansas requires that applicants have passed a standard examination.

"Pennsylvania grants reciprocity on a blanket form¹ conforming to the I. A. O. B. resolution.

"Idaho has granted reciprocity to Illinois, Missouri, Pennsylvania and Wisconsin.

"The District of Columbia has reciprocity only with Massachusetts.

"The following States do not grant reciprocity: Arizona, California, Colorado, Delaware, Florida, Louisiana, New Mexico, New York, Rhode Island, Washington, West Virginia and Wyoming."² It is evident from the varying attitudes of the 48 States on the matter of reciprocity that in most cases a state of lower requirements will grant reciprocity to optometrists qualified to practice

¹ International Association of Boards of Examiners in Optometry.

² "The Optical Journal and Review of Optometry," June 15, 1933, page 136. Quotation from an article on Reciprocity.

in states of more stringent requirements.

"Optometry's first attempt to formulate a syllabus was made in St. Louis in 1925. An inspection and rating of the twenty-six existing schools of optometry followed, being carried out by the educational committee of the International Association of Boards of Examiners in Optometry; and two-thirds of them were closed. The survivors were given fixed educational standards to maintain and were rated accordingly.

"In the fall of 1932, a complete revision of the optometric syllabus was accomplished under the distinguished leadership of Dr. Ernest Eimer, chairman of the educational committee of the International Association of Boards of Examiners in Optometry, aided by Dr. Frederic A. Woll, who had contributed such valuable assistance in the original effort to establish our educational standards.

"This turned out to be the most thorough rearrangement of optometric courses ever attempted, and it resulted in the adoption of a syllabus which I think will stand for many years to come as approximating the ideal of balance and comprehensiveness for our science. A general inspection of schools of optometry was begun last year following the adoption of the revised syllabus, and ratings¹ will follow in due course."

1

From "A Survey of Optometry" by William B. Needles, President, Northern Illinois College of Optometry, Chicago.

Table 6 shows the number of graduates from American Schools of Optometry in 1933. The original table from which this was taken had listed the graduates from 1920 to 1933.¹ It showed that 1933 had the largest total number of graduates for a single year since 1920. Taking total figures, the Northern Illinois College of Optometry has graduated, during the period 1920-1933, more candidates than all of the other colleges put together.

Table 6

GRADUATES FROM AMERICAN SCHOOLS OF OPTOMETRY
For the Year 1933

Northern Illinois College of Optometry-----	178
University of Southern California-----	8
Pennsylvania College of Optometry-----	51
Columbia University-----	25
Massachusetts School of Optometry-----	17
University of Rochester-----	9
Northern Pacific-----	4
University of Ohio-----	19
University of California-----	7
Total	317

The University of Rochester, according to a letter sent to the writer, under date of December 5, 1934, said: "The Board of Trustees of the University of Rochester have recently decided to discontinue the course in optometry with the graduation of the students now registered. It has been found that in New York State, Columbia can take care of the preparation of all those seeking to enter optometry."

The College of Optometry of Canada at 138 St. George

¹ From "A Survey of Optometry by William B. Needles, President, Northern Illinois College of Optometry, Chicago.

Street, Toronto 5, Ontario, offers a course under the direction of the Board of Examiners in Optometry of the Province of Ontario. Although the writer requested a catalogue from the University of Montreal College of Optometry and has not yet received it, there is no reason to believe that the course has been discontinued.

The University schools offer a four-year course leading to a Bachelor's degree--sometimes it is Bachelor of Science and sometimes it is Bachelor of Arts--plus a certificate in optometry. Some of the private schools also grant certificates for a short course, but for the full course taking usually three years (sometimes less) there is a Doctor's degree. It is Doctor of Optometry, or Doctor of Ocular Science usually. There is strong feeling in the profession against the academic stand of the Universities in refusing to grant the Doctor's degree on completion of four years of work or less. The contention is that it does not take five or six years to earn the Doctor's degree in optometry because there is not as much ground to cover in this field as there is in medicine or in philosophy--and that not granting the degree is a serious handicap to the graduate in his profession.

The courses vary in content, with the advantages from the practical side and the clinical-practice side, in favor of the independent school. The University training, as a rule, is only offered as a department of

the Department of Physics; and while it has many of the academic electives that are required in the college for the Bachelor's degree and do not appear at all in the curriculum of the average independent school, it lacks the number of hours of supervised clinical-instruction and office-practice technique of the school that makes the teaching of optometry its one major function.

Tuition fees run from about \$200 per year (two semesters) to \$400 per year. They vary with the college, and with the year of study, since in some years a greater outlay is needed for professional equipment than in others.

CHAPTER XIII

SUMMARY AND CONCLUSIONS

The manufacturing and marketing of eyeglass frames and lenses is still developing; it is by no means a static or unprogressive industry. In the last century, more ground has been covered in the scientific prescription of corrective lenses and comfortable and practical eyeglass frames than in the preceding six or seven centuries. Not only has superstition and opposition been overcome on the part of the early conservative medical and clerical practitioners, but the present-day public has been educated, for the most part, to realize the values of wearing glasses. Eyeglasses today are creations of beauty; and harmonize with the dress and the physique of the wearer.

Common defects of the eye: nearsightedness, farsightedness, astigmatism, double vision, and presbyopia (failing sight due to old age) may now be corrected by properly prescribed and fitted glasses. Efficiency of the individual, as well as his comfort, is promoted by eyeglasses; and it is to the advantage of the individual to see that the only pair of eyes he will ever have is being properly taken care of.

To increase the number of patients who are being helped by wearing eyeglasses, the bringing to their attention the benefits of wearing eyeglasses and the handsome and becoming styles in which such eyeglasses may be purchased is a legitimate and laudable way of increasing the potential market for eyeglass frames and lenses. Suggestions for "educational" advertising, directed at specific consumer groups, may be obtained from the Better Vision Institute of New York City.

Compulsory eye examinations have been the practice in relatively few industries; and, if it were free from any ulterior motives on the part of the industry or on the part of the cooperating optometrists, such examinations would be of economic value to both the employer and the employee.

The great potential market for eyeglasses is being gradually realized, but in some instances there is recourse to questionable trade practices. Trade rebates and alliances, unreasonably high profits, leasing of clinical sales to unscrupulous opticians, and unwholesome corporate practices are considered by the intelligent layman as unfair and unethical practices. It is common knowledge that the members of the industries condone these practices, although they will not readily admit their existence to an outsider.

There are only a few trade journals and associations

in the manufacturing and marketing of eyeglass frames and lenses. This is partly due to the size of the industry in comparison with other major industries; and, perhaps, partly due to the monopolistic features of the industry at the manufacturing point. One manufacturer virtually controls over fifty per cent of the industry.

There is an apparent lack of solid, unifying organization on each level of distribution. Although horizontal trade organizations do exist, they seem to include only a small proportion of the firms concerned and are not very strong in their limitations. This is particularly evident among the retail distributors. On the manufacturing and wholesaling level, the virtually monopolistic character of the industry makes for a little more uniformity of trade practices--at least within a given geographic section. Actual facts to support these conclusions are difficult to get in authoritative form.

Advertising in the industry is confined almost entirely to trade journals and to posters displayed in the stores and offices of the retail dispensers. Practically all of the advertising is done by the manufacturer, although the independent jobber does a little; and occasionally the retailer appropriates a small advertising budget.

The distribution set-up indicates that there is a large mark-up in the ultimate consumer price of eyeglasses.

The wholesaler and the manufacturer are frequently only departments of the same firm. The justification of the retailer for the great mark-up is the service that he renders. It has been left to the judgment of the reader to decide whether or not that service is a justification. By a personal investigation, it was shown that prices for the filling of the same prescription varied with the type of establishment. The educating of the consumer in methods of shopping for eyeglasses would be enlightening, and socially valuable.

For the practice of optometry, all of the states of the United States now have some legal restrictions. The educational requirements for optometrists have increased from practically nothing to very high standards in some of the states. There is such a wide disparity, however, that it might be well to have Federal examinations and requirements for the practice of optometry. The private schools and the boards of examiners have done much to raise the educational level of those institutions, and to disqualify schools that do not come up to the requisite standards. Federal examinations and educational requirements would help to raise further the professional standard of the optometrist.

Since it is an object of this paper to encourage further research in a field in which only the surface has been touched, it is suggested that the vocational

and educational opportunities in optometry would make a good topic. The economic value of the eye and the controlled experiments in industry with workers with corrected and uncorrected vision is another suggestion related to the general field.

APPENDIX

ROCKY MOUNTAIN - Typical Forest

Figure 1

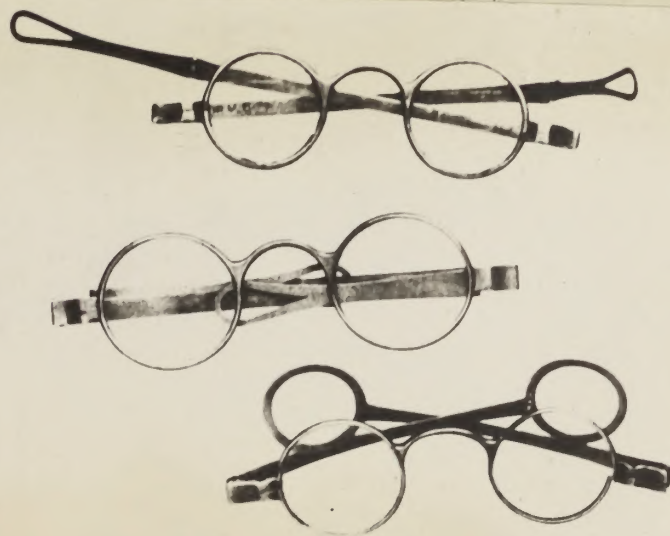
ILLUSTRATION FROM
"THE EYE AND HOW WE SEE"
BETTER VISION INSTITUTE



ROGER BACON — *Optical Pioneer*

Figure 4

PHOTOSTATIC COPY
from
"THE CONNOISSEUR"
October, 1934



18TH CENTURY SILVER FRAMES SIDE PIECES WITH LOOPED ENDS

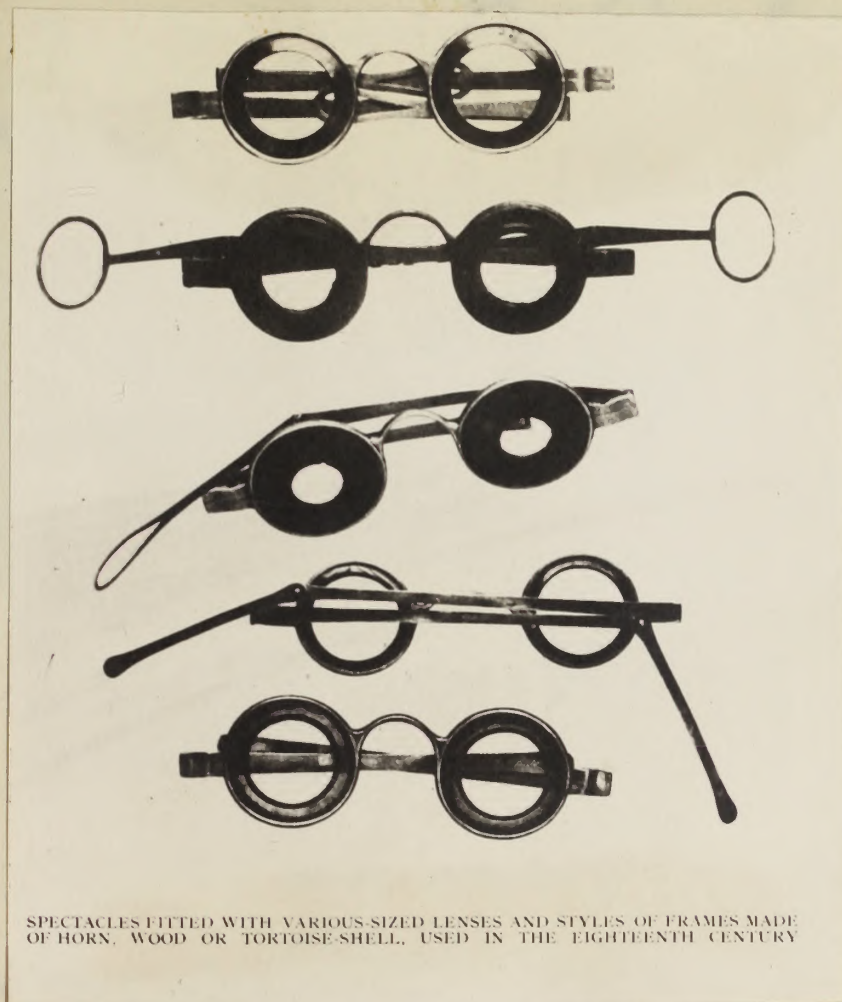
Figure 5

IN THE COURT OF THE
COMMONS
OF GREAT BRITAIN
October 1854



Figure 2

PHOTOSTATIC COPY
from
"THE CONNOISSEUR"
October, 1934



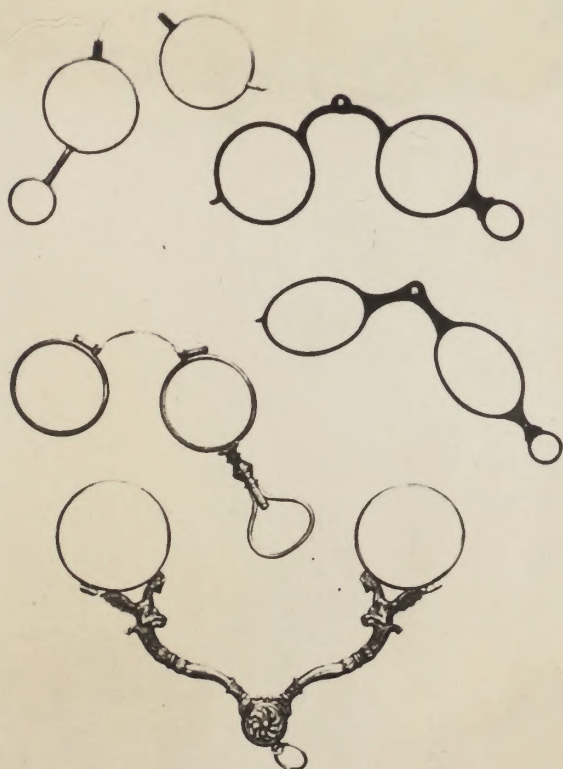
SPECTACLES FITTED WITH VARIOUS-SIZED LENSES AND STYLES OF FRAMES MADE OF HORN, WOOD OR TORTOISE-SHELL, USED IN THE EIGHTEENTH CENTURY

Figure 6

Figure 7



SINGLE EYEGLASSES, KNOWN AS "QUIZZING" GLASSES IN GOLD, PINCHBECK AND SILVER: LATE EIGHTEENTH CENTURY



A FRENCH HAND FRAME AND TYPES OF FOLDING EYEGLASSES OF THE LATE EIGHTEENTH AND NINETEENTH CENTURIES

PHOTOSTATIC COPIES
from
"THE CONNOISSEUR"
October, 1934



Figure 7



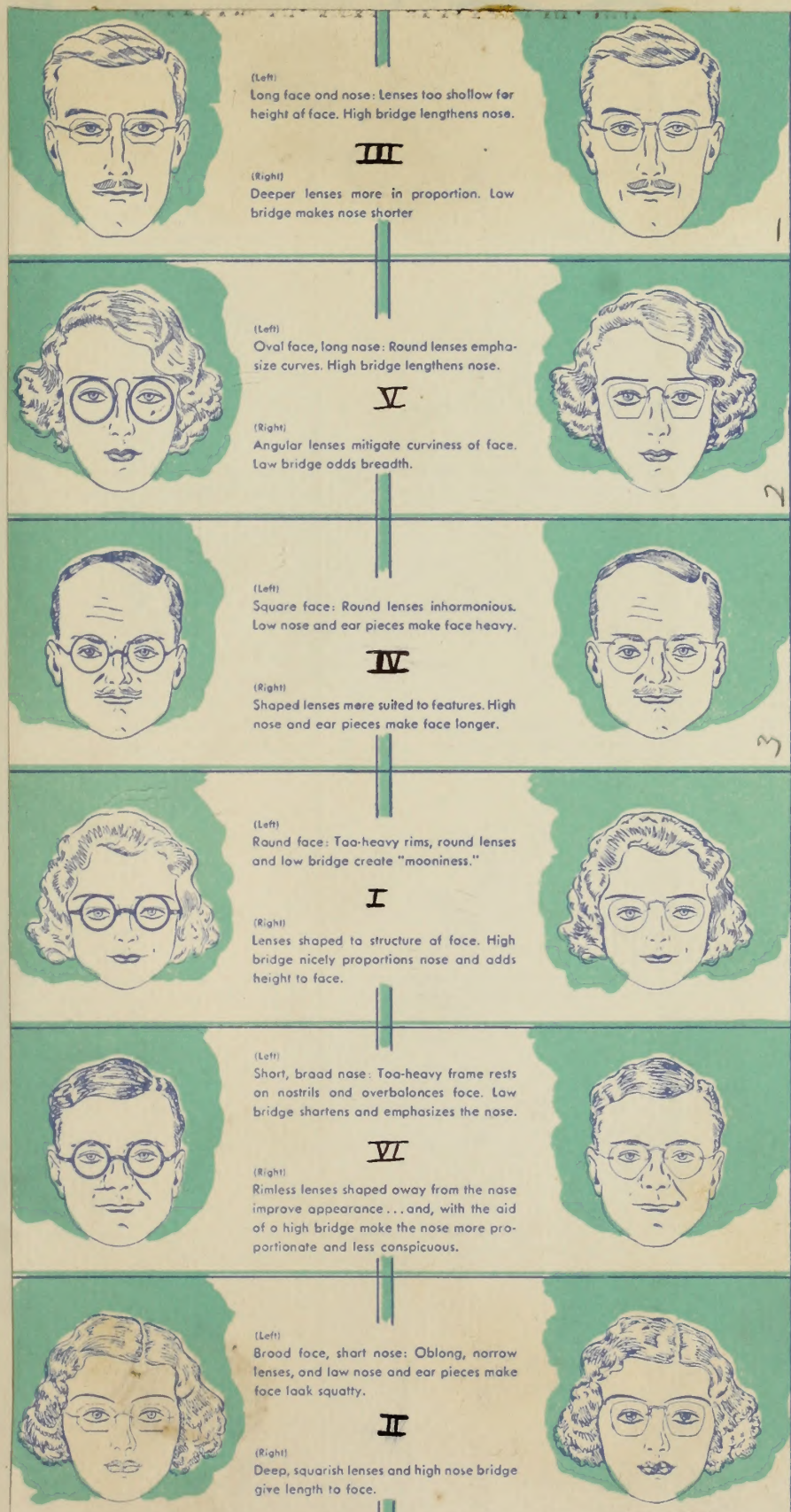
Photostat made
from
original
October, 1934



ILLUSTRATION FROM
"THE EYE AND HOW WE SEE"
BETTER VISION INSTITUTE



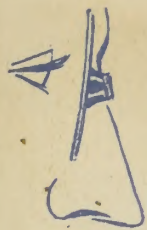
BENJAMIN FRANKLIN — *Inventor of the Bifocal
(Double Vision) Lens*



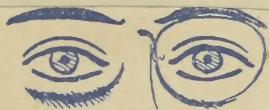
THESE ILLUSTRATIONS
are from
"FASHION'S GLASS"

Better Vision
Institute

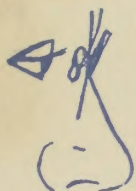
Figure 9



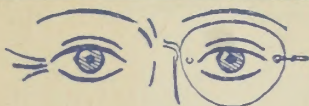
An overly-long nose is shortened by a straight, low-set nose piece.



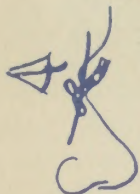
Puffy bags or dark circles beneath the eyes are hidden by skillfully shaped and fitted lenses.



A short nose gains length from a highly-arched bridge.



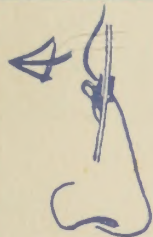
Glasses first conceal crows' feet; then by relieving eyestrain, banish them.



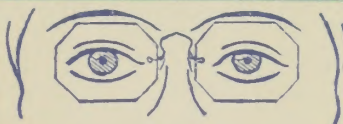
A concavely-curved nose is made to seem straighter by a set-away bridge.



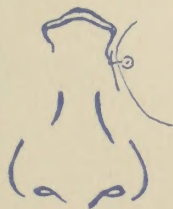
Straight sided lenses lessen the prominence of high cheek bones and face fullness.



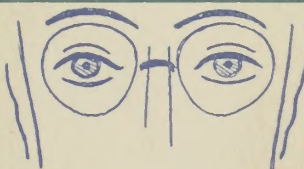
The curve of a Roman nose is concealed by glasses set low.



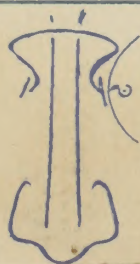
Angular lenses counteract manniness in a round face.



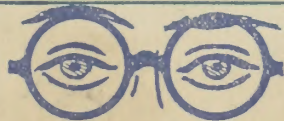
A short broad nose should have a high, wide bridge and cut-away lenses.



Deep-bottomed oval lenses soften a face that is square and long.



A long thin nose is offset by glasses having a low, wide bridge.



The symmetry of round or oval lenses counteracts irregularity of feature.

THESE ILLUSTRATIONS
are from
"FASHION'S GLASS"
BETTER VISION INSTITUTE

Figure 10

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1. Personal Interviews
2. Correspondence
3. Moving Pictures and Factory Visits
4. Periodicals
5. Books and Miscellaneous Publications

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